

Ontario Energy Board  
COST CLAIM FOR HEARINGS



Affidavit and Summary of Fees and Disbursements

This form should be used by a party to a hearing before the Board to identify the fees and disbursements that form the party's cost claim. Paper and electronic copies of this form and itemized receipts must be filed with the Board and served on one or more other parties as directed by the Board in the applicable Board order. Please ensure all required fields are filled in and the Affidavit portion is signed and sworn or affirmed.

Instructions

- Required data input is indicated by yellow-shaded fields. Formulas are present in the document to assist with the calculation of the cost claim.

- All claims must be in Canadian dollars. If applicable, state exchange rate and country of initial currency.

Rate: 1.11 Country: United States

- A separate "Detail of Fees and Disbursements Being Claimed" (comprising a "Statement of Fees Being Claimed" and a "Statement of Disbursements Being Claimed") is required for each consultant or lawyer/articling student/paralegal. However, only one "Summary of Fees and Disbursements" covering the whole of the party's cost claim should be provided.

- The cost claim must be supported by a completed Affidavit signed by a representative of the party.

- A CV for each consultant must be attached unless, for a given consultant, a CV has been provided to the Board in another process within the last 24 months.

- Except as provided in section 7.03 of the Practice Direction on Cost Awards, itemized receipts must be provided.

File # EB- 2012-0451-0433-0074 Process: Hearing re: Application for Leave to Conduct
Party: Council of Canadians Affiant's Name: Steven Shrybman
HST Number: HST Rate Ontario: 13.00% GST Rate (B.C. 5%)
Full Registrant [checked]
Unregistered [ ]
Other [ ]
Qualifying Non-Profit [ ]
Tax Exempt [ ]

Affidavit

I, Steven Shrybman, of the City/Town of Ottawa in the Province/State of Ontario, swear or affirm that:

- 1. I am a representative of the above-noted party (the "Party") and as such have knowledge of the matters attested to herein.
2. I have examined all of the documentation in support of this cost claim, including the attached "Summary of Fees and Disbursements Being Claimed", "Statement(s) of Fees Being Claimed" and "Statement(s) of Disbursements Being Claimed".
3. The attached "Summary of Fees and Disbursements Being Claimed", "Statement(s) of Fees Being Claimed" and "Statement(s) of Disbursements Being Claimed" include only costs incurred and time spent directly for the purposes of the Party's participation in the Ontario Energy Board process referred to above.
4. This cost claim does not include any costs for work done, or time spent, by a person that is an employee or officer of the Party as described in sections 6.05 and 6.09 of the Board's Practice Direction on Cost Awards.

Signature of Affiant

Sworn or affirmed before me at the City/Town of Ottawa in the Province/State of Ontario, on February 26/14 (date)

Commissioner for taking Affidavits

AMANDA MARIE QUINN, a Commissioner, etc., City of Ottawa, for Sack Goldblatt Mitchell LLP, Barristers and Solicitors. Expires May 1, 2014.

Ontario Energy Board  
COST CLAIM FOR HEARINGS



Affidavit and Summary of Fees and Disbursements

File # EB- 2012-0451-0433-0074

Process: Hearing re: Application for Leave to Conduct

Party: Council of Canadians

Summary of Fees and Disbursements Being Claimed

Legal/consultant fees	\$183,852.50
Disbursements	\$ 7,623.53
HST	\$123,648.58
<b>Total Cost Claim</b>	<b>\$215,124.61</b>

**Ontario Energy Board  
COST CLAIM FOR HEARINGS**



**Detail of Fees and Disbursements Being Claimed**

<b>File # EB-</b> <u>2012-0451-0433-0074</u>	<b>Process:</b> <u>Hearing re: Application for Leave to Construct</u>
<b>Party:</b> <u>Council of Canadians</u>	<b>Name:</b> <u>Steven Shrybman</u>
Completed Years Practising/Years of relevant experience _____ _____	
<b>Counsel/Articling Student/Paralegal:</b> <input checked="" type="checkbox"/>	
<b>Consultant:</b> <input type="checkbox"/>	
<b>CV attached:</b> <input checked="" type="checkbox"/>	<b>CV not required:</b> <input type="checkbox"/>

**Statement of Fees Being Claimed**

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	348.60	\$330.00	115,038.00	\$14,954.94	\$129,992.94
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference	13.50	\$330.00	\$4,455.00	\$579.15	\$5,034.15
Attendance - Oral Hearing	31.30	\$330.00	\$10,329.00	\$1,342.77	\$11,671.77
Argument	57.60	\$330.00	\$19,008.00	\$2,471.04	\$21,479.04
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			<b>148,830.00</b>	<b>\$19,347.90</b>	<b>\$168,177.90</b>

**Statement of Disbursements Being Claimed**

	Net Cost	HST	Total
Photocopies	\$902.50	\$117.33	\$1,019.83
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier	\$20.71	\$2.69	\$23.40
Telephone	\$72.14	\$9.38	\$81.52
Postage	\$11.20	\$1.46	\$12.66
Transcripts		\$0.00	\$0.00
Travel: Air	\$2,379.33	\$309.31	\$2,688.64
Travel: Car		\$0.00	\$0.00
Travel: Rail	\$205.50	\$26.72	\$232.22
Travel (Other):		\$0.00	\$0.00
Parking	\$48.13	included	\$48.13
Taxi or Airport Limo	\$103.43	\$13.45	\$116.88
Accommodation		\$0.00	\$0.00
Meals	\$139.50	\$18.14	\$157.64
Other: Computer searches	\$553.03	\$71.89	\$624.92
<b>TOTAL DISBURSEMENTS:</b>	<b>\$4,435.47</b>	<b>\$570.35</b>	<b>\$5,005.82</b>

BLUELINE

Job # \_\_\_\_\_  
RECEIPT FOR CAB FARE

Amount 10.4 Date Oct-15-13

From \_\_\_\_\_

To \_\_\_\_\_

Cab No. 106 Driver [Signature]

H.S.T. Included in meter fare



# RECEIPT



Cab No. 145 G.S.T. \_\_\_\_\_

From \_\_\_\_\_

To \_\_\_\_\_

Date 15/10/13 Amount 22.00

Signature [Signature]

**416.751.5555**

**Beck Taxi Streets to**  
Toronto's visual search engine

POSITANO RESTAURANT  
633 MOUNT PLEASANT M4S2M9  
TORONTO ON  
20225102  
GH2022510202

\*\*\*\* PURCHASE \*\*\*\*

10-08-2013 21:09:37  
Acct # \*\*\*\*\*6076 C  
Exp Date \*\*/\*\* Card Type VI  
Name: SHRYBMAN/STEVEN  
A000000031010 Visa Credit

Trace # 186  
Inv. # 160  
Auth # 081852 RRN 001169021

Purchase \$131.36  
Tip \$26.27  
Total \$157.63

( 00 ) APPROVED-THANK YOU

Retain this copy for your records  
Customer copy

# DINE-IN RECEIPT

POSITANO RESTAURANT  
416-9323982

TABLE - 2

SOLD BY #1:  
TAG #100949 10/08/2013 8:36:39 PM

1	CASA	6.50	6.50 T
1	CALAMARI	10.50	10.50 T
1	PASTA SPECIAL	21.00	21.00 T
-1	SYRENUSE	13.50	13.50 T
1	BRANZINO	28.00	28.00 T
1	DESSERT	7.50	7.50 T
1	COFFEE/TEA	2.50	2.50 T
1	CAPPUCCINO	3.75	3.75 T
1	DOUBLE ESPRES	3.75	3.75 T
2	BEER	6.00	12.00 T
1	GL CHARDONNAY	7.25	7.25 T

SUBTOTAL 116.25  
SALES TAX 15.11  
TOTAL 131.36  
BALANCE DUE 131.36

ACCOUNT

GRAZIE!



Best Western  
Roehampton Hotel  
& Suites

PLUS

**\$16.00** plus HST

Room No. \_\_\_\_\_

*THE BEST WESTERN PLUS ROEHAMPTON HOTEL (the "HOTEL") will not be held responsible for loss or damage to the vehicle for which this check has been issued and which damage occurs between the premises and the place at which the vehicle is either picked up from or returned to by the Hotel employees, regardless of how such loss, damage or injury may have been caused. THE BEST WESTERN PLUS ROEHAMPTON HOTEL is also not responsible for loss or damage to any articles left in said vehicle.*

Guest Copy

**Nº 1945**



Best Western  
Roehampton Hotel  
& Suites

PLUS

**\$16.00** plus HST

Room No. \_\_\_\_\_

*THE BEST WESTERN PLUS ROEHAMPTON HOTEL (the "HOTEL") will not be held responsible for loss or damage to the vehicle for which this check has been issued and which damage occurs between the premises and the place at which the vehicle is either picked up from or returned to by the Hotel employees, regardless of how such loss, damage or injury may have been caused. THE BEST WESTERN PLUS ROEHAMPTON HOTEL is also not responsible for loss or damage to any articles left in said vehicle.*

Guest Copy

**Nº 5111**

**Lisa Purdy**

---

**From:** Lynn Ritchie  
**Sent:** October 4, 2013 12:37 PM  
**To:** Steven Shrybman; Lisa Purdy  
**Subject:** RE: Cheque to Mr. Ingraffea

Hi Lisa – here is the additional amount:

**Passenger Information**

---

**1: Mr John Hughes : Adult (16+), Ticket Number: 0142126183126**

Frequent Flyer Prog :	None	Meal Preference:	Regular
Payment Card:	XXXX-XXXX-XXXX-6076	Special Needs:	None
Seat Selection:	AC034 23A		

---

**Additional charges and/or refund summary**

---

	<b>Additional charges</b>
<b>Passenger Type</b>	<b>Adult</b>
<b>Air Transportation Charges</b>	
Airfare (includes <u>Surcharges</u> )	295.00
<b>Taxes, Fees and Charges</b>	
Canada Goods and Services Tax (GST/HST #10009-2287 RT0001)	14.75
<b>Total Additional Fare</b>	<b>309.75</b>
<b>Extra Charges (Change Fee)</b>	
Change Fee	0.00
<b>Total Extra Charge (Change Fee)</b>	<b>0.00</b>
Number of passengers	1
<b>Grand Total - Canadian dollars</b>	<b>\$309.75</b>

---

**From:** Steven Shrybman  
**Sent:** October 4, 2013 12:06 PM  
**To:** Lisa Purdy  
**Cc:** Lynn Ritchie  
**Subject:** RE: Cheque to Mr. Ingraffea

in reverse order

no cancellation for hotel

Lynn rebooked the flight - and may have the new amount.

BLUE LINE TAXI  
613-238-1111  
CAR 1234  
TAXI TAB

TAXI  
.11  
366

08/11/2013 13:44:50  
PURCHASE

072

Transaction # 14  
Card Type: Visa  
Acct: \*\*\*\*\*6076  
Entry: Swiped  
Terminal ID: 29R30191  
Merchant ID: 000295  
Ba: 001673  
T: 17.50  
Base Amt: 39.85  
Tip: 4.50  
Total: 39.85

Auth. Code: 052747  
Response: APPROVED

CUSTOMER COPY

CUSTOMER SERVICE  
1 866 565 8294  
help@taxitab.com  
DRIVER #

13-840

3  
he

ICE  
94  
com



Job #

RECEIPT FOR CAB FARE

13-840

Amount \$10.00 Date Sep 11 / 13

From

To

Cab No. 541 Driver EA

H.S.T. Included in meter fare



08/01/2013 20:35:01  
PURCHASE

BLUE LINE TAXI  
613-238-1111  
CAR 1132  
TAXI INH 13-840

Transaction # 1  
Card Type: Visa  
Acct: \*\*\*\*\*6076  
Entry: Swiped  
Terminal ID: 29R30191  
Merchant ID: 000295  
Ba: 001673  
Base Amt: 17.50  
Auth. Code: 054570  
Response: APPROVED

CUSTOMER COPY  
CUSTOMER SERVICE  
1 866 565 8294  
help@taxitab.com  
DRIVER

BECK TAXI  
1 ST UNION DR  
Toronto ON, M4A 2S6  
www.becktaxi.com  
(416)751 5555

13-840

SALE

MIC: 5921808  
TID: 43921808  
Batch: 08/26, 13  
APP CODE: 076415  
VISA  
\*\*\*\*\*6076C  
F#: 00000002  
Seq: 372001001002  
08:39:20  
CVC: Y  
\*\*\*

AMOUNT \$16.75

00 - APPROVED - 001

Visa Credit  
AID: A0000000031010  
TVR: 00 00 00 80 00  
TSE: F8 00

Thank You for Choosing  
Beck Taxi  
3 Ways to Order  
PHONE-WEB-APP

1463P  
CAB 1463

1 BLUE LINE TAXI  
613-238-1111  
CAR 1445  
TAXI TAB 13-840

08/26/2013 16:32:09  
PURCHASE

Transaction # 1  
Card Type: Visa  
Acc: \*\*\*\*\*6076  
Entry: Swiped  
Terminal ID: 29R31110  
Merchant ID: 29RRRR  
Batch: 001408  
Trace Number: 007396  
Bse Amt: 19.00

Auth.Code: 066632  
Response: APPROVED

CUSTOMER COPY

CUSTOMER SERVICE  
1 866 565 8294  
help@taxitab.com  
DRIVER #

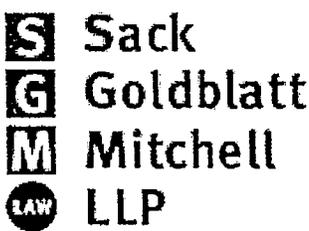
Your booking is confirmed. Booking reference: **PKYZWV**

- ✓ ■ An email booking confirmation has been sent to: **davehughes@twincomm.**
- Use your booking reference to retrieve your official Itinerary/Receipt at air

**Passengers** Mr John David Hughes

Flight	From	To	Departure	Arrival
AC6582	Campbell River (YBL)	Toronto (YYZ)	07:00	16:22
AC034	- Connection in Vancouver -		Mon 30-Sep 2013	Mon 30
AC101	Toronto (YYZ)	Campbell River (YBL)	12:00	16:50
AC6597	- Connection in Vancouver -		Wed 02-Oct 2013	Wed 02

Lynn Ritchie  
 Assistant to Mark Wright, Vanessa  
 Payne and Steven Shrybman  
 T 416.979.6421  
 F 416.591.7333  
 E [lritchie@sqmlaw.com](mailto:lritchie@sqmlaw.com)



20 Dundas Street W., Suite 1100  
 Toronto ON M5G 2G8  
[www.sqmlaw.com](http://www.sqmlaw.com)

1244.00  
 105.41 tx  
 -----  
 1349.91

*I will SEND this  
 EMAIL so you can  
 see the total.*

**THIS E-MAIL MAY CONTAIN CONFIDENTIAL INFORMATION WHICH IS PROTECTED BY LEGAL PRIVILEGE. IF YOU ARE NOT THE INTENDED RECIPIENT, PLEASE IMMEDIATELY NOTIFY US BY REPLY E-MAIL OR BY TELEPHONE (COLLECT IF NECESSARY), DELETE THIS E-MAIL AND DESTROY ANY COPIES.**

**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** September 5, 2013 10:24 PM  
**To:** Lisa Purdy  
**Subject:** FW: Itinerary - Please do not reply to this email

I have changed my return flight to Ottawa and saved some money. So please substitute this invoice for the previous one – they refunded the difference.

---

**From:** PorterAirlines@flyporter.com [mailto:PorterAirlines@flyporter.com]  
**Sent:** September 5, 2013 4:22 PM  
**To:** Steven Shrybman  
**Subject:** Itinerary - Please do not reply to this email

More destinations. More affordably.

Help us reach new destinations. Visit [porterplans.com](http://porterplans.com).

porter

---

---

**Passenger Itinerary**

Thank you very much for your business. We have confirmed your reservation in our system. You will not receive a paper ticket. Please review flight information for accuracy and make note of ID requirements and recommended check-in times. You may print this itinerary for your reference.

MR. STEVEN SHRYBMAN  
106 HELENA AVE  
TORONTO, ON M6G 2H2  
CANADA

**Confirmation Number:** R3JLXI      **Agent Name:** SHRYBMAN  
**Booking Date:** 03 Sep 2013      **Booked By:** X

**Passenger Information:**

---

Name	VIPorter Number	Flight #/Seat #
Mr. Steven SHRYBMAN	8340000055	255/NA

---



**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** September 2, 2013 9:12 PM  
**To:** Lisa Purdy  
**Subject:** FW: Itinerary - Please do not reply to this email

Please bill this to the COC on the OEB file

---

**From:** PorterAirlines@flyporter.com [mailto:PorterAirlines@flyporter.com]  
**Sent:** September 2, 2013 9:11 PM  
**To:** Steven Shrybman  
**Subject:** Itinerary - Please do not reply to this email



**Passenger Itinerary**

Thank you very much for your business. We have confirmed your reservation in our system. You will not receive a paper ticket. Please review flight information for accuracy and make note of ID requirements and recommended check-in times. You may print this itinerary for your reference.

MR. STEVEN SHRYBMAN  
106 HELENA AVE  
TORONTO, ON M6G 2H2  
CANADA

**Confirmation Number:** **RCVPQX**                      **Agent Name:** SHRYBMAN  
**Booking Date:** 03 Sep 2013                      **Booked By:**

**Passenger Information:**

---

Name	VIPorter Number	Flight #/Seat #
Mr. Steven SHRYBMAN	8340000055	260/NA

---

**Flight Information:**

---

Date	Flight	Depart	Arrive	Stops
11 Sep 2013	260	Ottawa (YOW) 14:20	Toronto (YTZ) 15:20	

---

**Fare Summary (CAD):**

---

Base Fare:	\$194.00
Air Traveller Security Charge:	\$7.12
NAV and Surcharges:	\$12.00
Airport Improvement Fee:	\$20.00
Harmonized Sales Tax:	\$30.31
	-----
Total Fare Price:	\$263.43
Visa:	\$263.43
	-----
Balance Due:	\$0.00

---

GST/HST Number: 841583271

QST Number: 1212573775

**Baggage Policy:**

**TWO items of carry-on baggage are permitted per fare-paying passenger.**

- Carry-on baggage is limited to two pieces:
  - 1 standard article not exceeding 55 cm x 40 cm x 23 cm (21.5" x 15.5" x 9") and weighing less than 9 kg (20 lb)
  - 1 personal article not exceeding 43 cm x 33 cm x 16 cm (17" x 13" x 6") and weighing less than 9 kg (20 lb)
- Items that are not permitted in carry-on baggage aboard the aircraft are those that present a potential hazard. They include, but are not limited to, weapons, tools, restraining devices, toy weapons, cutting and puncturing devices (knives, box cutters, scissors, straight razors) ice skates and other hazardous items as defined and regulated by law including explosives, poisons, and other toxic materials.
- All carry-on baggage must fit in the sizing units located both at check-in and the gate areas.
- On board the aircraft, all carry-on baggage must be stowed under the seat or in the overhead compartments.
- The following items are not counted as carry-on: coats, cameras, receptacles containing human remains, containers carrying life sustaining items, strollers, child restraint systems, crutches, canes, walkers and other such items.
- Porter may require that an item of carry-on baggage travel as checked luggage if the bag cannot be safely stowed in the cabin.

**For travel before August 1, 2013 or for flights booked before July 3, 2013**

**ONE item of checked baggage is permitted, free of charge, per fare-paying passenger.**

- One piece of checked baggage is accepted free of charge for each fare paying passenger.
- The total combined weight of all checked baggage is limited to 23 kg (50 lb).
- The weight of the baggage is combinable for passengers booked under the same reservation file.
- A second piece of checked baggage is permitted for a charge of \$20 CAD/USD per direction.
- There is a \$50 CAD/USD charge per additional bag, over and above 2 pieces of baggage.

**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** August 19, 2013 5:09 PM  
**To:** Lisa Purdy  
**Subject:** FW: Steven Shrybman : Your VIA itinerary and receipt for booking AIF728

-please bill to Gas Pipe – re attendance at settlement conference in Toronto on <sup>Aug.</sup> ~~Sept~~ 28

---

**From:** VIA Rail Canada [mailto:service@viarail.ca]  
**Sent:** August 19, 2013 5:06 PM  
**To:** Steven Shrybman  
**Subject:** Steven Shrybman : Your VIA itinerary and receipt for booking AIF728

## ITINERARY / RECEIPT - NOT VALID FOR TRAVEL

Thank you for choosing  
VIA Rail Canada .



BOOKING CONFIRMATION: AIF728

STEVEN SHRYBMAN, VIA PRÉFÉRENCE: 88\*\*\*53

**IMPORTANT - AN E-BOARDING PASS HAS BEEN ISSUED FOR EACH SEGMENT OF THIS TRIP AND HAS BEEN SENT IN A SEPARATE E-MAIL.** Please bring all e-boarding passes on your trip and review this confirmation carefully as it includes some important information about travelling with us.

### ITINERARY # 1

**TRAIN 59** | [info](#)

From: OTTAWA Mon. Aug 26, 2013

Departure: 17:02 PM

To: TORONTO Mon. Aug 26, 2013

Arrival: 21:01 PM

Class: Business

Car : 1 Seat : 5A Window

Remarks: Operated by: VIA Rail Canada. This train goes through Ottawa on the way from Montreal to Toronto.

### BAGGAGE ENTITLEMENT

#### Carry-on baggage

OPTION 1 (Recommended in sleeping cars)

- 2 articles

Maximum

11.5 kg (25 lb.) each

54.5 x 39.5 x 23 cm (21.5 x 15.5 x 9 in.)

- 1 personal article

Maximum

11.5 kg (25 lb.)

43 x 15 x 33 cm (17 x 6 x 13 in.)

For this option, articles of more than 11.5 kg (25 lb.) are not allowed on board.

OR

OPTION 2 (NOT recommended in sleeping cars)

- 1 article

Maximum

18 kg (40 lb.)

158 linear cm (62 linear in.) (length + width + height)

- 1 personal article

Maximum

11.5 kg (25 lb.)

43 x 15 x 33 cm (17 x 6 x 13 in.)

For this option, an article between 41 and 50 lb. (19 and 23 kg) is allowed on board, but is subject to a surcharge of \$20 (taxes included, per one-way trip) for excess weight. An article weighing more than 50 lb. is not allowed on board.

### Checked baggage

No checked baggage.

\*VIA Rail reserves the right to weigh, strictly enforce baggage allowances and collect excess baggage charges.

## CONDITIONS OF CONTRACT

1. Your rail ticket is not transferable and is valid only for travel on the train and date shown. You may exchange or refund this e-boarding pass up until the scheduled departure time indicated on this ticket, subject to the conditions of the applicable fare plan. Please advise VIA Rail in advance of any travel cancellation.
2. Times shown in timetable or elsewhere are not guaranteed.
3. In case of necessity, VIA Rail may cancel a train or substitute alternate transportation without notice.
4. To ensure all passengers' safety, VIA Rail reserves the right to inspect all baggage.
5. You are responsible at all times for your carry-on baggage. VIA Rail assumes a limited liability for loss or damage to checked baggage. Ask VIA Rail personnel for more details.

Other conditions apply to your travel.

## RECEIPT

### FARE INFORMATION

Steven Shrybman (Adult) ----- \$111.87

FARE: \$99.00      G.S.T/H.S.T.: \$12.87      P.S.T.: \$0.00      TOTAL: \$111.87

### TAX INFORMATION

Taxable fare: \$99.00

G.S.T/H.S.T. number: 105521785RT001

PAYMENT 4500\*\*\*\*\*6076 - AUTHORIZATION # 020642

TRANSACTION DATE: 08/19/2013

## ITINERARY      FARE PLAN      REFUND/EXCHANGE CONDITIONS

OTTAWA /  
TORONTO

BUSINESS

Before Departure : Exchangeable and refundable less a \$24.75 plus applicable tax(es) service charge.  
After Departure : Non-exchangeable and non-refundable.

Other Useful Information (links)

**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** September 19, 2013 8:41 AM  
**To:** Lisa Purdy  
**Subject:** FW: Itinerary - Please do not reply to this email

This should get billed to the OEB.

---

**From:** PorterAirlines@flyporter.com [mailto:PorterAirlines@flyporter.com]  
**Sent:** September 18, 2013 11:20 PM  
**To:** Steven Shrybman  
**Subject:** Itinerary - Please do not reply to this email

More destinations. More affordably.

Help us reach new destinations. Visit [porterplans.com](http://porterplans.com). 

porter

---

---

**Passenger Itinerary**

Thank you very much for your business. We have confirmed your reservation in our system. You will not receive a paper ticket. Please review flight information for accuracy and make note of ID requirements and recommended check-in times. You may print this itinerary for your reference.

MR. STEVEN SHRYBMAN  
106 HELENA AVE  
TORONTO, ON M6G 2H2  
CANADA

**Confirmation Number:** **X6FK4M**      **Agent Name:** SHRYBMAN  
**Booking Date:** 19 Sep 2013      **Booked By:**

**Passenger Information:**

---

Name	VIPorter Number	Flight #/Seat #
Mr. Steven SHRYBMAN	8340000055	251/NA

---

**Flight Information:**

---

Date	Flight	Depart	Arrive	Stops
20 Sep 2013	251	Toronto (YTZ) 10:10	Ottawa (YOW) 11:06	

---

**Fare Summary (CAD):**

---

Base Fare:	\$109.00
NAV and Surcharges:	\$12.00
Air Traveller Security Charge:	\$7.12
Airport Improvement Fee:	\$20.00
Harmonized Sales Tax:	\$19.26
	-----
Total Fare Price:	\$167.38
Visa:	\$167.38
	-----
Balance Due:	\$0.00

---

GST/HST Number: 841583271

QST Number: 1212573775

**Baggage Policy:**

**TWO items of carry-on baggage are permitted per fare-paying passenger.**

- Carry-on baggage is limited to two pieces:
  - 1 standard article not exceeding 55 cm x 40 cm x 23 cm (21.5" x 15.5" x 9") and weighing less than 9 kg (20 lb)
  - 1 personal article not exceeding 43 cm x 33 cm x 16 cm (17" x 13" x 6") and weighing less than 9 kg (20 lb)
- Items that are not permitted in carry-on baggage aboard the aircraft are those that present a potential hazard. They include, but are not limited to, weapons, tools, restraining devices, toy weapons, cutting and puncturing devices (knives, box cutters, scissors, straight razors) ice skates and other hazardous items as defined and regulated by law including explosives, poisons, and other toxic materials.
- All carry-on baggage must fit in the sizing units located both at check-in and the gate areas.
- On board the aircraft, all carry-on baggage must be stowed under the seat or in the overhead compartments.
- The following items are not counted as carry-on: coats, cameras, receptacles containing human remains, containers carrying life sustaining items, strollers, child restraint systems, crutches, canes, walkers and other such items.
- Porter may require that an item of carry-on baggage travel as checked luggage if the bag cannot be safely stowed in the cabin.

**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** September 2, 2013 9:25 PM  
**To:** Lisa Purdy  
**Subject:** FW: Itinerary - Please do not reply to this email

This gets billed to the same file

*COC - OEB*

---

**From:** PorterAirlines@flyporter.com [mailto:PorterAirlines@flyporter.com]  
**Sent:** September 2, 2013 9:24 PM  
**To:** Steven Shrybman  
**Subject:** Itinerary - Please do not reply to this email



**Passenger Itinerary**

Thank you very much for your business. We have confirmed your reservation in our system. You will not receive a paper ticket. Please review flight information for accuracy and make note of ID requirements and recommended check-in times. You may print this itinerary for your reference.

MR. STEVEN SHRYBMAN  
106 HELENA AVE  
TORONTO, ON M6G 2H2  
CANADA

**Confirmation Number:** **R3JLXI**                      **Agent Name:** SHRYBMAN  
**Booking Date:** 03 Sep 2013                      **Booked By:**

**Passenger Information:**

---

Name	VIPorter Number	Flight #/Seat #
Mr. Steven SHRYBMAN	8340000055	271/3C

---

**Flight Information:**

---

Date	Flight	Depart	Arrive	Stops
05 Sep 2013	271	Toronto (YTZ) 18:55	Ottawa (YOW) 19:51	

---

**Fare Summary (CAD):**

---

Base Fare:	\$324.00
NAV and Surcharges:	\$12.00
Air Traveller Security Charge:	\$7.12
Airport Improvement Fee:	\$20.00
Harmonized Sales Tax:	\$47.21
	-----
Total Fare Price:	\$410.33
Seat Fee:	\$0.00
	-----
Total Including Service Charges:	\$410.33
Visa:	\$410.33
	-----
Balance Due:	\$0.00

---

GST/HST Number: 841583271

QST Number: 1212573775

**Baggage Policy:**

**TWO items of carry-on baggage are permitted per fare-paying passenger.**

- Carry-on baggage is limited to two pieces:
  - 1 standard article not exceeding 55 cm x 40 cm x 23 cm (21.5" x 15.5" x 9") and weighing less than 9 kg (20 lb)
  - 1 personal article not exceeding 43 cm x 33 cm x 16 cm (17" x 13" x 6") and weighing less than 9 kg (20 lb)
- Items that are not permitted in carry-on baggage aboard the aircraft are those that present a potential hazard. They include, but are not limited to, weapons, tools, restraining devices, toy weapons, cutting and puncturing devices (knives, box cutters, scissors, straight razors) ice skates and other hazardous items as defined and regulated by law including explosives, poisons, and other toxic materials.
- All carry-on baggage must fit in the sizing units located both at check-in and the gate areas.
- On board the aircraft, all carry-on baggage must be stowed under the seat or in the overhead compartments.
- The following items are not counted as carry-on: coats, cameras, receptacles containing human remains, containers carrying life sustaining items, strollers, child restraint systems, crutches, canes, walkers and other such items.
- Porter may require that an item of carry-on baggage travel as checked luggage if the bag cannot be safely stowed in the cabin.

**For travel before August 1, 2013 or for flights booked before July 3, 2013**

**ONE item of checked baggage is permitted, free of charge, per fare-paying passenger.**

- One piece of checked baggage is accepted free of charge for each fare paying passenger.

**Lisa Purdy**

---

**From:** Steven Shrybman  
**Sent:** May 1, 2013 11:01 AM  
**To:** Lisa Purdy  
**Subject:** FW: Steven Shrybman : Your VIA itinerary and receipt for booking ZKM398

please bill to gas pipe

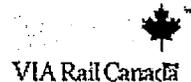
(and if I don't indicate otherwise, please also put a claim in for this expense)

---

**From:** VIA Rail Canada [service@viarail.ca]  
**Sent:** 01 May 2013 07:26  
**To:** Steven Shrybman  
**Subject:** Steven Shrybman : Your VIA itinerary and receipt for booking ZKM398

**ITINERARY / RECEIPT - NOT VALID FOR TRAVEL**

Thank you for choosing  
VIA Rail Canada .



BOOKING CONFIRMATION: ZKM398

**STEVEN SHRYBMAN**

**IMPORTANT - AN E-BOARDING PASS HAS BEEN ISSUED FOR EACH SEGMENT OF THIS TRIP AND HAS BEEN SENT IN A SEPARATE E-MAIL.** Please bring all e-boarding passes on your trip and review this confirmation carefully as it includes some important information about travelling with us.

**ITINERARY # 1**

**TRAIN 656** | [info](#)

From: TORONTO Thu. May 2, 2013      Departure: 16:20 PM  
To: OTTAWA Thu. May 2, 2013      Arrival: 20:19 PM  
Class: **Business Discounted fare**      Car : 1 Seat : 8C Aisle  
Remarks: Operated by: VIA Rail Canada. Route: Toronto-Ottawa-Montréal

**BAGGAGE ENTITLEMENT**

**Carry-on baggage**

- OPTION 1 (Recommended in sleeping cars)
  - 2 articles  
Maximum  
11.5 kg (25 lb.) each  
54.5 x 39.5 x 23 cm (21.5 x 15.5 x 9 in.)
  - 1 personal article  
Maximum  
11.5 kg (25 lb.)  
43 x 15 x 33 cm (17 x 6 x 13 in.)

For this option, articles of more than 11.5 kg (25 lb.) are not allowed on board.

OR

OPTION 2 (NOT recommended in sleeping cars)

- 1 article  
Maximum  
18 kg (40 lb.)  
158 linear cm (62 linear in.) (length + width + height)

- 1 personal article  
Maximum  
11.5 kg (25 lb.)  
43 x 15 x 33 cm (17 x 6 x 13 in.)

For this option, an article between 41 and 50 lb. (19 and 23 kg) is allowed on board, but is subject to a surcharge of \$20 (taxes included, per one-way trip) for excess weight. An article weighing more than 50 lb. is not allowed on board.

### Checked baggage

No checked baggage.

\*VIA Rail reserves the right to weigh, strictly enforce baggage allowances and collect excess baggage charges.

## CONDITIONS OF CONTRACT

1. Your rail ticket is not transferable and is valid only for travel on the train and date shown. You may exchange or refund this e-boarding pass up until the scheduled departure time indicated on this ticket, subject to the conditions of the applicable fare plan. Please advise VIA Rail in advance of any travel cancellation.
2. Times shown in timetable or elsewhere are not guaranteed.
3. In case of necessity, VIA Rail may cancel a train or substitute alternate transportation without notice.
4. To ensure all passengers' safety, VIA Rail reserves the right to inspect all baggage.
5. You are responsible at all times for your carry-on baggage. VIA Rail assumes a limited liability for loss or damage to checked baggage. Ask VIA Rail personnel for more details.

Other conditions apply to your travel.

## RECEIPT

### FARE INFORMATION

Steven Shrybman (Adult) ..... \$120.35

FARE: \$106.50      G.S.T/H.S.T.: \$13.85      P.S.T.: \$0.00      TOTAL: \$120.35

### TAX INFORMATION

Taxable fare: \$106.50  
G.S.T/H.S.T. number: 105521785RT001

PAYMENT 4500\*\*\*\*\*6076 - AUTHORIZATION # 024050

TRANSACTION DATE: 05/01/2013

## ITINERARY      FARE PLAN      REFUND/EXCHANGE CONDITIONS

TORONTO /      SEAT SALE      Non-exchangeable and non-refundable.  
OTTAWA

### Other Useful Information (links)

- [Seat Assignment in Economy Class](#)

- [VIA's baggage policy](#)
- [VIA Terms and Conditions](#)

### **Customer Support**

- For assistance or queries regarding your train booking, please contact VIA Rail for help at [service@viarail.ca](mailto:service@viarail.ca)

### **Risk Free Booking**

- Fully refundable prior to paper ticket issuance if cancelled **online** within **24 hours of booking** and **before scheduled train departure**, whichever comes first.

### **How to cancel a booking online?**

- You can cancel your booking online if you have not yet exchanged this booking confirmation for a paper ticket.
- Go to [reservia.viarail.ca/cancellation/request.aspx?l=en](http://reservia.viarail.ca/cancellation/request.aspx?l=en)
- Follow the instructions

### **How to get a refund if paper tickets have already been issued?**

- Call 1 888 VIA-RAIL (842-7245) to cancel your booking
- Then go to a VIA station with your unused ticket (including the "Receipt" portion) and the credit card used to purchase your ticket, to obtain your refund.

### **Do you want to book a hotel room?**

VIA Rail offers you special deals on hotel rooms. Whether you're travelling for business or pleasure, we can help you complete your travel plans in one stop with [www.viarail.ca](http://www.viarail.ca)

[Book a hotel](#)

From: PorterAirlines@flyporter.com [PorterAirlines@flyporter.com]  
Sent: 02 October 2013 12:59  
To: Steven Shrybman  
Subject: Itinerary - Please do not reply to this email

porter

More destinations. More affordably.

Help us reach new destinations. Visit [porterplans.com](http://porterplans.com).

### Passenger Itinerary

Thank you very much for your business. We have confirmed your reservation in our system. You will not receive a paper ticket. Please review flight information for accuracy and make note of ID requirements and recommended check-in times. You may print this itinerary for your reference.

MR. STEVEN SHRYBMAN  
500-30 METCALFE ST  
OTTAWA, ON K1P 5L4  
CANADA

Confirmation Number:	<b>B7EFTW</b>	Agent Name:	SHRYBMAN
Booking Date:	02 Oct 2013	Booked By:	

### Passenger Information:

Name	VIPorter Number	Flight #/Seat #
Mr. Steven SHRYBMAN	8340000055	251/NA 274/NA

---

**Flight Information:**

---

Date	Flight	Depart	Arrive	Stops
06 Oct 2013	251	Toronto (YTZ) 10:30	Ottawa (YOW) 11:26	
07 Oct 2013	274	Ottawa (YOW) 20:00	Toronto (YTZ) 21:00	

---

**Fare Summary (CAD):**

---

Base Fare:	\$218.00
NAV and Surcharges:	\$24.00
Air Traveller Security Charge:	\$14.24
Airport Improvement Fee:	\$40.00
Harmonized Sales Tax:	\$38.52
Total Fare Price:	\$334.76
Visa:	\$334.76
Balance Due:	\$0.00

---

GST/HST Number: 841583271

QST Number: 1212573775

**Baggage Policy:**

**TWO items of carry-on baggage are permitted per fare-paying passenger.**

- Carry-on baggage is limited to two pieces:
  - 1 standard article not exceeding 55 cm x 40 cm x 23 cm (21.5" x 15.5" x 9") and weighing less than 9 kg (20 lb)
  - 1 personal article not exceeding 43 cm x 33 cm x 16 cm (17" x 13" x 6") and weighing less than 9 kg (20 lb)
- Items that are not permitted in carry-on baggage aboard the aircraft are those that present a potential hazard. They include, but are not limited to, weapons, tools, restraining devices, toy weapons, cutting and puncturing devices (knives, box cutters, scissors, straight razors) ice skates and other hazardous items as defined and regulated by law including explosives, poisons, and other toxic materials.
- All carry-on baggage must fit in the sizing units located both at check-in and the gate areas.
- On board the aircraft, all carry-on baggage must be stowed under the seat or in the overhead compartments.
- The following items are not counted as carry-on: coats, cameras, receptacles containing

1/2 to CoC re: OEB file

Council of Canadians  
700 - 170 Laurier Avenue West  
Ottawa, Ontario  
K1P 5V5

Date: 04 Feb 2014  
Invoice # Sample  
Matter # 13-840

Attention: Brent Patterson

**RE: Council of Canadians re: Enbridge Gas Distribution**

<b>FEES</b>		<b>HOURS</b>	
18-Apr-13	Review Board notice and reporting to clients re: same;	0.80	SLS
24-Apr-13	Review of file to briefing S. Hart re: attendance at telephone conference on April 26	1.00	SLS
24-Apr-13	E-mail correspondence with S. Shrybman re: OEB conference call on behalf of Council of Canadians; printing and reviewing information;	0.30	SH
25-Apr-13	Review application; Telephone conversation with D. Poch re: coordination; email correspondence with L. Sumi and clients;	6.80	SLS
25-Apr-13	Review of materials and preparation for OEB conference call to take place April 25,2013; Discussion with S. Shrybman;	1.00	SH
26-Apr-13	Email exchange with other party re: L. Sumi evidence;	0.40	SLS
26-Apr-13	Participation in Issues and Process conference call re: Enbridge /union applications (OEB);	3.30	SH
26-Apr-13	Preparing notes on conference call and emailing summary to S. Shrybman;	0.30	SH
30-Apr-13	Reporting note to client;	1.00	SLS
30-Apr-13	Discussion with other intervenors;	0.50	SLS
30-Apr-13	Prepare for and attend proceeding before the Board;	6.40	SLS

01-May-13	Email exchanges with client re: nature and scope of intervention;	1.10	SLS
01-May-13	Telephone call with L. Sumi re: retainer and to review her most recent work;	1.00	SLS
01-May-13	Review of file;	0.60	SLS
01-May-13	Debrief clients on hearing day; seek instructions;	1.90	SLS
02-May-13	Review of file in preparation for client contact call;	1.40	SLS
02-May-13	Telephone conversation with D. Poch re: coordination of expert evidence;	0.50	SLS
02-May-13	Further exchanges with client and L. Sumi;	1.80	SLS
06-May-13	Review L. Sumi paper from Gas Market Regulation proceedings;	0.90	SLS
06-May-13	Email correspondence with L. Sumi and D. Poch;	0.40	SLS
06-May-13	Review T. Colborne article to email request for expert evidence;	1.20	SLS
06-May-13	Review A. Ingraffea reports; review letter of inquiry re: possible retainer to give expert evidence;	1.30	SLS
13-May-13	Preparation for telephone call with D. Hughes and L. Sumi re: possible retainer as expert witness;	1.50	SLS
13-May-13	Preparation for telephone call with D. Hughes and D. Roberts re: possible retainer as expert witness;	1.30	SLS
13-May-13	Review email correspondence;	0.80	SLS
13-May-13	Follow up correspondence with D. Hughes and D. Roberts re: retainer, funding and directing both to relevant Board files;	0.90	SLS
15-May-13	Review Enbridge application;	1.50	SLS
15-May-13	Email exchange with E. Lui;	0.50	SLS
16-May-13	Telephone conversation with E. Lui for update and instructions;; exchange with D. Poch re: integration and relevance of bubble evidence; exchange with D. Hughes re:	7.10	SLS

19-May-13	interrogatories; further review of application and supporting documents; review of NEB TCPL toll decision referenced by Enbridge Gas Distribution; email correspondence with clients and consultants re: mandate and interrogatories; review TCPL open season;; Review Union Gas proposal;	3.00	SLS
20-May-13	Review interrogatories and experts comments; prepare information requests;	8.00	SLS
21-May-13	Finalize file and serve information requests;	6.50	SLS
22-May-13	Brief review and filing of information requests by various parties;	1.00	SLS
27-May-13	Review production order;	0.30	SLS
01-Jun-13	Review correspondence;	2.00	SLS
10-Jun-13	Correspondence with L. Sumi and review outline of her report; telephone conversation with D. Poch re: form and format for our evidence; review of file and information requests;	5.20	SLS
11-Jun-13	Review A. Ingraffea articles and prepare memo to him;	1.00	SLS
11-Jun-13	Review responses to information requests; email exchange with L. Sumi;	1.00	SLS
12-Jun-13	Review information request exchanges between Enbridge and other parties;	2.50	SLS
18-Jun-13	Review L. Sumi's draft, related email exchange and correspondence with A. Ingraffea; consultation with D. Poch;	2.20	SLS
18-Jun-13	Review email correspondence of parties;	0.50	SLS
18-Jun-13	Consult with experts;	0.90	SLS
19-Jun-13	Review articles by expert; draft outline for A. Ingraffea report; email correspondence with A. Ingraffea;	4.20	SLS
20-Jun-13	Email exchange with experts; draft A. Ingraffea report; telephone conversation with D. Hughes;	6.90	SLS
20-Jun-13	Telephone conversation with D. Poch re: CH4 leakage in larger system;	0.30	SLS

22-Jun-13	Review motion re: Gaz Metro and Union Gas;	1.00	SLS
23-Jun-13	Exchange with consultants re: their respective reports;	1.10	SLS
23-Jun-13	Review and comment on Ingraffea; email to D. Poch and L. Sumi re: same;	1.80	SLS
24-Jun-13	Further exchanges with D. Poch and his consultants re: TCPL agenda for mainline; receipt of next drafts from A. Ingraffea and L. Sumi;	1.90	SLS
24-Jun-13	Email exchanges with D. Poch and L. Sumi re: A. Ingraffea; prepare first draft and add comments and remit to A. Ingraffea;	2.10	SLS
26-Jun-13	Final review of A. Ingraffea's evidence;	1.50	SLS
26-Jun-13	Review and comment on Ingraffea draft # 3;	2.00	SLS
26-Jun-13	Review and comment on L. Sumi opinion;	3.50	SLS
27-Jun-13	Review of D. Hughes first draft;	3.60	SLS
27-Jun-13	Review of D. Hughes second draft;	1.80	SLS
27-Jun-13	Email exchanges with experts, interveners and to review correspondence from the parties and interveners;	2.10	SLS
27-Jun-13	Review of L. Sumi final response to IR;	2.20	SLS
28-Jun-13	Various exchanges with experts; finalize, file and serve the expert reports of L. Sumi, A. Ingraffea and D. Hughes;	7.40	SLS
30-Jun-13	Serve all Parties;	0.40	SLS
02-Jul-13	Email correspondence with clients; review PO; review POs #4 and #5; email correspondence with experts re: interrogatory timelines; review Union Gas motion; email correspondence with D. Poch re: Union Gas motion;	3.40	SLS
04-Jul-13	Receipt and review of revised Union Gas Application;	1.50	SLS
06-Jul-13	Further review of IRs and email exchange with experts re: same;	2.90	SLS

06-Jul-13	Review Presidents Action Plan re: UGL and EGD IRs; exchanges with A. Ingraffea and L. Sumi re: same;	2.40	SLS
08-Jul-13	Review IRs to D. Hughes and telephone conversation re: same;	1.00	SLS
09-Jul-13	Reviewing correspondence and motion materials filed by the parties; correspondence with experts re: interrogatories;	2.50	SLS
10-Jul-13	Review IRs and Telephone conversation with L. Sumi, A. Ingraffea and D. Hughes; memo to student re: article search; review correspondence and motion materials; exchanges with student re: responses to interrogatories;	9.20	SLS
10-Jul-13	Retrieving academic articles requested by Union Gas interrogatories;	0.70	MS
11-Jul-13	Review correspondence from parties and attend hearing online;	1.20	SLS
11-Jul-13	Exchange with student and staff re: responses to interrogatories;	0.50	SLS
12-Jul-13	Review correspondence and filings of the parties and board; Telephone conversation with D. Poch re: recent developments and potential impacts on approvals; draft interrogatories for TCPL;	4.80	SLS
13-Jul-13	Review file and correspondence with D. Hughes re: IRs;	1.00	SLS
15-Jul-13	Memos to A. Ingraffea and L. Sumi re: their response to IRS;	1.80	SLS
15-Jul-13	Review Enbridge's revised application;	1.20	SLS
15-Jul-13	Review and comment on L. Sumi's IR responses;	0.50	SLS
15-Jul-13	Further review of revised application;	1.50	SLS
15-Jul-13	Review of correspondence from Parties;	0.70	SLS
15-Jul-13	Review letter from Board; exchanges with A. Ingraffea and review of his response to President's Action Plan;	1.50	SLS
15-Jul-13	Review of D. Hughes' response to IRs;	1.25	SLS
16-Jul-13	Review draft IR responses; various exchanges with experts;	7.20	SLS

17-Jul-13	Review correspondence filed by parties;	0.80	SLS
17-Jul-13	Further review of A. Ingraffea IR responses and instructing assistant re: final formatting;	1.30	SLS
17-Jul-13	Prepare for and telephone interview with D. Hughes re: IRs;	2.60	SLS
17-Jul-13	Exchanges with L Sumi re: Union IR File retrieval and review her response;	1.20	SLS
17-Jul-13	Edit D. Hughes' UGL and EGD responses;	1.40	SLS
18-Jul-13	Review and finalize L. Sumi's response;	1.60	SLS
18-Jul-13	Review and finalize D. Hughes' EGD IR response;	0.90	SLS
18-Jul-13	Telephone conversation with D. Poch re: coordination;	0.30	SLS
18-Jul-13	Detailed review of D. Hughes' UGL IR response;	5.20	SLS
19-Jul-13	Finalize responses; arranging for filing and serving responses to UGL, EGD, CCC and Housing Federation;	6.90	SLS
19-Jul-13	Correspondence with and reporting to client;	1.00	SLS
22-Jul-13	Review correspondence and receipt of revised EGD application;	1.50	SLS
23-Jul-13	Review P.O. #6 and to correspondence scheduling with experts;	1.50	SLS
24-Jul-13	Exchanges with clients re: availability for hearing and Telephone conversation with D. Poch re: procedural issues;	1.40	SLS
25-Jul-13	Review revised NOA Enbridge and TLPC Notice of Intent to Revise Evidence;	2.20	SLS
26-Jul-13	Email exchange with L. Sumi re: her availability to attend hearings;	0.30	SLS
26-Jul-13	Review Union and Enbridge Responses to TLPC letter;	1.20	SLS
29-Jul-13	Review of file and procedural order No. 7;	2.10	SLS

29-Jul-13	Exchanges with our experts and Board Counsel re: scheduling of our witness panel;	0.90	SLS
29-Jul-13	Reporting to client;	0.60	SLS
29-Jul-13	Review evidence on fracking;	0.80	SLS
29-Jul-13	Legal research re jurisdiction of OEB;	1.00	MS
30-Jul-13	Email correspondence with A. Ingraffea re: his op-ed in NYT;	0.40	SLS
30-Jul-13	Communication with clients re: preparation for hearing;	0.60	SLS
30-Jul-13	Email correspondence from Board;	0.40	SLS
30-Jul-13	Legal research re jurisdiction of OEB;	1.00	MS
31-Jul-13	Prepare for and telephone conversation with D. Poch re: latest filings by TCPL and to discuss collaboration on the evidence;	0.50	SLS
31-Jul-13	Review correspondence from the parties re: TCPL request for schedule revision and to review Board order arising therefrom;	1.10	SLS
31-Jul-13	Review ED submissions on its motion to have costing information placed on the public record;	0.70	SLS
31-Jul-13	Review EGD notice of revised application;	0.30	SLS
31-Jul-13	Review of EGD revised application;	0.50	SLS
31-Jul-13	Legal research on OEB jurisdiction: review of QL research; OEB cases and divisional court decision;	1.50	MS
01-Aug-13	Review Board IRs to EGD on updated evidence; review TCPL responses to COC IRs re: latest announcement concerning pipeline east; briefing clients re: same; review procedural order # 8	2.90	SLS
01-Aug-13	Review EGD responses to ED motion;	0.40	SLS
01-Aug-13	Review APPRO IRs of EGD;	0.40	SLS

01-Aug-13	Review GEC IRs; motion by Mississaguas;	1.30	SLS
01-Aug-13	Research re OEB jurisdiction;	1.00	MS
02-Aug-13	Review of IRs filed by several parties;	2.30	SLS
02-Aug-13	Email correspondence with clients re: various issues;	0.50	SLS
06-Aug-13	Discussion with student re scope of OEB environmental mandate;	0.40	SLS
06-Aug-13	Exchanges with client re: file;	1.10	SLS
06-Aug-13	Meeting with S. Shrybmann re: research on OEB extra-territorial jurisdiction;	0.30	MS
07-Aug-13	Review correspondence from parties;	0.40	SLS
07-Aug-13	Review student memo re: scope of OEB environmental jurisdiction and to follow up re: same;	1.20	SLS
08-Aug-13	Review correspondence from Board;	0.20	SLS
08-Aug-13	Meetings with client re: impact of project on gas supply to the GTA through TCPL mainline and to follow up correspondence;	2.60	SLS
09-Aug-13	Exchanges with client re: issues relating to the conversation of the TCPL mainline;	1.20	SLS
12-Aug-13	Review TCPL responses to COC and other interrogatories;	2.30	SLS
13-Aug-13	Further review of TCPL responses to COC, Board, and other interrogatories;	1.10	SLS
15-Aug-13	Review of Union Metro and TCPL applications to NEB; review filings and procedural orders;	1.80	SLS
15-Aug-13	Research on OEB jurisdiction and environmental assessment process;	2.00	MS
16-Aug-13	Review correspondence from the Board;	0.40	SLS
16-Aug-13	Legal research;	2.50	MS

19-Aug-13	Review TCPL revised submissions; memorandum to consultants; follow up conversations with D. Hughes and L. Sumi re: possible IRs;	2.60	SLS
20-Aug-13	Email exchange with experts; meeting with student re: Board's environmental mandate; Telephone conversation with D. Poch and Elston re: same; legal research re: extent of OEB jurisdiction re: Greenhouse gas emissions; drafting further IRs in respect of TCPL supplementary evidence;	7.10	SLS
20-Aug-13	Further legal research on scope of OEB's public interest mandate for environmental impact analysis; preparation of memo;	5.50	MS
21-Aug-13	Exchanges with client re: inter-relationship between mainline and GTA project; monitor IRs from parties;	1.80	SLS
26-Aug-13	Review procedural Order 9; review file;	2.80	SLS
26-Aug-13	Review TCPL responses to our IRs and memo to experts re: same;	1.40	SLS
26-Aug-13	Exchanges and Telephone conversation with D. Hughes re: TCPL responses to our IRs;	0.90	SLS
26-Aug-13	Memo to experts re: scheduling;	0.30	SLS
26-Aug-13	Review of file in preparation for settlement conference;	2.50	SLS
26-Aug-13	Further legal research and preparation of revised memo on OEB environmental jurisdiction;	3.00	MS
27-Aug-13	Completion of research and memo on OEB environmental jurisdiction;	3.30	MS
28-Aug-13	Prepare for and attend settlement conference; review M. Sandilands memo;	7.30	SLS
29-Aug-13	Prepare for and attending settlement conference Day II;	6.20	SLS
30-Aug-13	Review correspondence re: hearing schedule and logistics;	1.20	SLS
02-Sep-13	Review file and correspondence from the parties; reporting to client; memo to experts re: scheduling and logistics;	1.60	SLS
03-Sep-13	Review cross estimates and correspondence;	0.80	SLS
03-Sep-13	Correspondence and meetings with other intervener re: issues;	0.90	SLS

04-Sep-13	Review latest estimates; revise my estimates accordingly;	0.50	SLS
04-Sep-13	Review party correspondence; review latest procedural order; facilitate exchange between GEC and D. Hughes re: the spread in gas prices Dawn v. Empress; coordinate schedule of appearance of our panel;	3.20	SLS
05-Sep-13	Prepare for and attend pre-hearing conference and Board proceeding; follow up communications with experts and clients; memorandum to experts re: modalities for their attendance for cross examination;	4.80	SLS
06-Sep-13	Review correspondence from parties; exchanges with clients, experts and other parties re: various matters	1.20	SLS
09-Sep-13	Discussions re: intervener funding; (N/C)	0.50	SLS
11-Sep-13	Preparation of cross; review correspondence from the parties; review of revised evidence of EGB; exchanges re: confidentiality undertaking; consultation with other intervener;	6.30	SLS
12-Sep-13	Prepare for and attend OEB hearing;	4.80	SLS
12-Sep-13	Meeting with counsel for other interveners;	0.20	SLS
13-Sep-13	Various exchanges with experts re: schedule for COC panel (hearing adjourned);	1.00	SLS
14-Sep-13	Review file, Union update and its responses to staff and other IRs; Telephone conversation with D. Poch re: TCPL's evidence; review correspondence from the parties;	7.20	SLS
16-Sep-13	Prepare for and attend OEB hearing;	5.60	SLS
17-Sep-13	Prepare for and attend OEB proceedings including conducting cross of Union panel; follow up correspondence with our experts re: reference to their evidence made during our cross;	6.90	SLS
19-Sep-13	Prepare for and attend OEB hearing;	3.00	SLS
19-Sep-13	Correspondence with experts re: critique by Union of their evidence;	0.90	SLS
24-Sep-13	Monitor proceedings; cross by ED of EGD alternatives panel;	4.60	SLS
27-Sep-13	Correspondence with experts and clients;	0.80	SLS

27-Sep-13	Preliminary review of transcripts;	1.00	SLS
28-Sep-13	Prepare for the appearance of the COC panel; correspondence from Board and with experts re: adjournment of their appearance on Oct. 1;	6.90	SLS
30-Sep-13	Correspondence with Board and experts re: rescheduling their appearance;	2.40	SLS
01-Oct-13	Further exchanges with the Board re: scheduling COC panel; communications with experts re: same; review party correspondence and evidence update by EGD;	2.20	SLS
02-Oct-13	Attending to logistical issues re: attendance of our experts; review incoming undertakings;	1.40	SLS
04-Oct-13	Reporting to clients re: progress of proceeding and scheduling of COC witness panel;	0.90	SLS
05-Oct-13	Review transcripts, evidence and IRs for the purpose of preparing COC witness panel;	8.00	SLS
07-Oct-13	Communications with experts re: pending appearance and to prepare cross examination of joint panel;	6.30	SLS
08-Oct-13	Meet with and prepare our witnesses for their appearance; (no charge)	4.00	SLS
09-Oct-13	Meet with and prepare witness panel; attend hearing to introduce our expert evidence; conduct cross examination of joint panel;	5.70	SLS
24-Oct-13	Preliminary review of EGD and Union Gas final arguments;	0.50	SLS
28-Oct-13	Review transcripts of cross examination;	2.80	SLS
29-Oct-13	Review file and drafting outline for argument;	6.40	SLS
29-Oct-13	Reading email from S. Shrybman re: Energy Board work;	0.10	JL
30-Oct-13	Review file, evidence, cross, IRs, our evidence in chief; drafting outline for argument;	6.80	SLS
31-Oct-13	Researching and writing on Section 2 of the OEB Act;	4.20	JL
01-Nov-13	Review term sheet filed this date by EGD and Union Gas;	1.20	SLS
01-Nov-13	Prepare final argument;	2.00	SLS

01-Nov-13	Communication with clients;	0.40	SLS
01-Nov-13	Writing memo on Section 2 of the Act;	4.40	JL
04-Nov-13	Exchange with K. Elston; email correspondence with A. Ingraffea re: boe equivalence; review correspondence from Board staff and parties concerning issues arising from the "final" term sheet; reviewing the evidence and cross examination; drafting final argument;	8.90	SLS
04-Nov-13	Research and writing submissions on extra-territorial jurisdiction of the OEB;	3.70	JL
05-Nov-13	Prepare final argument; review various exchanges re: questions arising from the filing of the revised term sheet;	8.80	SLS
05-Nov-13	Researching Keystone history and writing memorandum	4.40	JL
06-Nov-13	Review of party and staff exchanges re: revised term sheet; drafting final argument;	7.90	SLS
06-Nov-13	Researching and writing memo;	7.50	JL
07-Nov-13	Review and exchange of correspondence and PO number Sheriff's Certificates;	1.10	SLS
07-Nov-13	Draft final argument;	7.80	SLS
07-Nov-13	Research and distinguishing cases in memorandum;	5.20	JL
08-Nov-13	Looking up legislative history of Section 2;	0.20	JL
13-Nov-13	Draft submissions;	10.90	SLS
13-Nov-13	Research on legislative history of section 2 of OEB Act;	1.90	JL
13-Nov-13	Researching legislative history;	2.10	JL
14-Nov-13	Draft submissions;	14.20	SLS
14-Nov-13	Researching and writing memo on legislative history of s. 2 of OEB Act;	3.10	JL

14-Nov-13	Reading, revising and editing submissions to Board;	3.40	JL
15-Nov-13	Draft submissions	3.00	SLS
15-Nov-13	Final revisions to submissions;	0.40	JL
17-Nov-13	Review Union Metro and TCPL applications to NEB; review filings and procedural orders;	1.80	SLS
10-Jan-14	Review invoices from experts; email correspondence re: same; organizing in preparation for making submissions on costs;	1.80	SLS
22-Jan-14	Review account;	0.40	SLS
28-Jan-14	Receipt and review of Board correspondence;	0.40	SLS
29-Jan-14	Report to client re: release of Board decision;	0.60	SLS
30-Jan-14	Review Board's decision to compose reporting memorandum to clients;	3.40	SLS
31-Jan-14	Teleconference debriefing with E. Lui re: Board decision;	0.80	SLS
03-Feb-14	Prepare account;	2.10	SLS
03-Feb-14	Review correspondence from interveners;	0.30	SLS
04-Feb-14	Further preparation of account;	1.10	SLS
04-Feb-14	Compose reporting memorandum to expert witnesses re: Board's decision;	0.80	SLS
04-Feb-14	Review correspondence from Enbridge;	0.20	SLS
<b>TOTAL HOURS</b>		<b>518.65</b>	
Total Fees	:	\$	155,675.50
GST/HST On Fees	:	\$	20,237.82
Total Fees and GST/HST	:	\$	175,913.32

**DISBURSEMENTS**

Computer search	\$	553.03
Photocopies	\$	902.50
Postage	\$	1.97
Telephone - long distance	\$	72.14
PUROLATOR INV # 420281491	\$	20.71
Transportation - Train	\$	99.00 ✓
Transportation - Airfare	\$	148.12 ✓
Transportation - Airfare	\$	233.12 ✓
Transportation - Airfare	\$	1,194.61 ✓
Transportation - Airfare	\$	148.12 ✓
Reimbursement of Expense - Flight Cancellation Fee*	\$	240.00 ✓
Canada Post - Postage	\$	9.23
Transportation - Airfare	\$	233.12 ✓
Transportation - Airfare	\$	274.12 ✓
Transportation - Taxi	\$	35.27 ✓
Transportation - Taxi	\$	15.49 ✓
Transportation - Taxi	\$	16.81 ✓
Transportation - Taxi	\$	14.82 ✓
Transportation - Taxi	\$	8.85 ✓
Reimbursement of Expenses	\$	681.59 ✓
Re-imbusement of expenses*	\$	850.00 ✓
TR FR 13-607 TO 13-840 Train disbursment	\$	106.50 ✓
Transportation - Airfare	\$	148.12 ✓

Total Disbursements	:	\$	6,007.24
GST/HST On Disbursements	:	\$	639.24
Total Disbursements and GST/HST	:	\$	6,646.48

**TOTAL INVOICE:** \$ 182,559.80

***For reference only - TRUST BALANCE:*** \$ \$0.00

Total GST/HST on this invoice is \$20,877.06

FEE SUMMARY

Lawyer	:	Hours	Hourly Rate	Amount
--------	---	-------	-------------	--------

STEVEN SHRYBMAN	:	451.35	\$330.00	\$148,945.50
SASHA HART	:	4.90	\$100.00	\$490.00
MARION SANDILANDS	:	21.80	\$100.00	\$2,180.00
JANINE LESPERANCE	:	40.60	\$100.00	\$4,060.00
Totals	:	518.65		\$155,675.50

**THIS IS OUR ACCOUNT HEREIN  
SACK GOLDBLATT MITCHELL LLP**

**PER:**

**STEVEN SHRYBMAN**

E.&O.E.

Any disbursements incurred on your behalf and not charged to your account will be billed later  
Our firm's GST/HST number is 12231 7019 RT0001.

\* items are tax exempt or tax free

In accordance with s.33 of the Solicitors Act, interest will be charged at 1.3% per annum on unpaid fees, charges and disbursements, calculated from a date which is one month after this statement is delivered.

## **THE FIRM**

Sack Goldblatt Mitchell LLP is one of Canada's leading labour law, civil litigation and criminal law firms. SGM also specializes in public interest law, Charter of Rights litigation, human rights law, and pension and administrative law.

SGM is particularly involved in efforts to resist the privatization of public services and resources. For instance, SGM represented two unions who successfully challenged what would have otherwise been the largest privatization in Canadian history, the proposed sale of Hydro One. We have also headed off schemes to privatize municipal water and sanitation services, and SGM is actively engaged in fighting to preserve the integrity of Medicare in the face of mounting privatization pressures.

## **STEVEN SHRYBMAN**

Steven obtained his law degree from Osgoode Hall Law School and was called to the Bar in 1981. Steven has been a member of the British Columbia Bar. He has been a partner at SGM since leaving his position as the Executive Directive of the West Coast Environmental Law Association in 2000.

Mr. Shrybman's practice focuses on international trade and public interest litigation, including issues concerning the environment, health care, human and labour rights, the protection of public services, natural resources policy, and intellectual property rights. He has prepared numerous legal opinions regarding the impact of international trade law on diverse areas of Canadian policy and law. His clients in this regard have included the Provinces of British Columbia, Manitoba and Ontario; the British Columbia, Ontario and Alberta Federations of Labour; the Canadian Union of Public Employees; the Communications, Energy and Paperworkers Union of Canada; the Canadian Autoworkers; the Romanow Commission and both the Canadian and International Library Associations.

Among dozens of public interest cases that Mr. Shrybman has argued, are the following:

- represented the Canadian Union of Public Employees and the Communications, Energy and Paperworkers Union of Canada in an application that prevented the sale of Ontario's electricity transmission system (the second largest in the world) that would have otherwise been the largest privatization in Canadian history - *Payne v. Wilson*, 2002 CanLII 45002 (ON CA);
- represented a coalition of national and international food safety and security groups as public interest interveners in a landmark Supreme Court of Canada



case involving Monsanto's assertion of patent right to seeds - *Monsanto Canada Inc. v. Schmeiser*, 2004 SCC 34, [2004] 1 SCR 902;

- represented the Canadian Labour Congress before the Supreme Court of Canada challenging the constitutionality of Canada's publicly funded, universal health care system, *Chaoulli v. Quebec (Attorney General)*, 2005 SCC 35, [2005] 1 SCR 791;
- represented a coalition of labour and public interest groups in proceedings before the Federal Court of Canada seeking to preserve the integrity of the Canadian Wheat Board - *Friends of the Canadian Wheat Board et al. v. the Attorney General of Canada*, Federal Court file T-1057-11;
- represented public interest interveners in several proceedings arising under the investor-state dispute procedures of the North American Free Trade Agreement - *UPS v. Canada* <http://www.international.gc.ca/trade-agreements-accords-commerciaux/disp-diff/parcel.aspx?lang=en&view=d>.  
*S.D Myers v. Canada*; <http://www.international.gc.ca/trade-agreements-accords-commerciaux/disp-diff/SDM.aspx?lang=en&view=d>;  
*Merrill Ring v. Canada*; <http://www.international.gc.ca/trade-agreements-accords-commerciaux/disp-diff/merrill.aspx?lang=en&view=d>

V:\Steven\CV Dec-11 (00377705).DOC

**Ontario Energy Board  
COST CLAIM FOR HEARINGS**



**Detail of Fees and Disbursements Being Claimed**

File # EB- <u>2012-0451-0433-0074</u>	Process: <u>Hearing re: Application for Leave to Conduct</u>
Party: <u>Council of Canadians</u>	Name: <u>Sasha Hart</u>
Completed Years Practising/Years of relevant experience	
Counsel/Articling Student/Paralegal: <input checked="" type="checkbox"/>	_____
Consultant: <input type="checkbox"/>	_____
CV attached: <input checked="" type="checkbox"/>	CV not required: <input type="checkbox"/>

**Statement of Fees Being Claimed**

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	4.90	\$100.00	\$490.00	\$63.70	\$553.70
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing			\$0.00	\$0.00	\$0.00
Argument			\$0.00	\$0.00	\$0.00
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			\$490.00	\$63.70	\$553.70

**Statement of Disbursements Being Claimed**

	Net Cost	HST	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air		\$0.00	\$0.00
Travel: Car		\$0.00	\$0.00
Travel: Rail		\$0.00	\$0.00
Travel (Other):		\$0.00	\$0.00
Parking		included	\$0.00
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation		\$0.00	\$0.00
Meals		\$0.00	\$0.00
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>		\$0.00	\$0.00

Note:

Sasha Hart worked as a summer law student with Sack Goldblatt Mitchell in 2010. She articulated with Sack Goldblatt Mitchell for the 2012/2013 articling term.

# SASHA HART

1872 Wolfe St., Montreal, QC H2L 3J8

Tel.: (438)880-6094/ (613) 834-3686 E-mail: sasha.hart@mail.mcgill.ca

---

## EDUCATION

---

**McGill University, Faculty of Law, (Montreal)** 2008-Present  
B.C.L./L.L.B expected January 2012

**Carleton University, Faculty of Arts, (Ottawa)** 2004-2008  
B.A. - Major(s): Law & Political Science  
• Graduated with Highest Honours

**St. Matthew High School, (Ottawa)** 2000-2004  
French Immersion Program – Certificat d'études en français  
• Valedictorian – Class of 2004; Female Athlete of the Year; School Letter Award

## AWARDS AND ACHIEVEMENTS

---

- McGill University Entrance Scholarship 2008
- Carleton University Dean's Honour List 2005-2008
- Carleton University Academic All-Canadian 2005-2007
- Carleton University Claude Bissell Scholarship 2007
- Carleton University David J. Bellamy Memorial Scholarship 2007
- Carleton University A. Davidson Dunton Scholarship 2006
- Jayne Peak Carleton University Award 2006
- Carleton University President's Scholars Entrance Scholarship 2004
- Raven Fund Athletic Scholarship 2007
- Ottawa Carleton Catholic School Board Trustee Award 2004
- Ontario Scholar Award 2004

## LAW-RELATED EXPERIENCE

---

**Sack, Goldblatt, Mitchell LLP (Ottawa)** 2007-2008; Summer 2009  
*Office Clerk*

- Created database of library books; made recommendations for additional books to acquire
- Opened/closed files; updated legal journals
- Performed receptionist duties: answered telephone, greeted clients etc.
- Carleton University Legal Internship completed at SGM (Research on DTCA for Steven Shrybman)

**PINAY- The Filipino Women's Organization in Quebec (Montreal)** 2008-Present  
*Student advocate*

- Conducted legal research on Canada's 'Live-In-Caregiver' program
- Prepared affidavits for complaint brought before the Quebec Human Rights Commission (QHRC)
- Prepared document presented at QHRC 'Right to Work Without Discrimination' Conference
- Interviewed caregivers in order to obtain information required for Temporary Work Permits

**Carleton University, Faculty of Law (Ottawa)** 2007-2008  
*Teaching Assistant*

- Graded course papers for 2<sup>nd</sup> year 'Public Law' course

- McGill Legal Information Clinic** 2009-Present  
*Volunteer Legal Assistant*
- Conducted research on questions of employment, family, immigration, and property law
  - Met with clients
- McGill International Journal of Sustainable Development Law and Policy** 2009-Present  
*Associate Editor*
- Critically assessed articles to determine whether they should be included in Journal
  - Made suggestions regarding text editing
- African and Canadian Women’s Human Rights Project (ACWHRP)** 2009-Present  
*Student Researcher*
- Conducted research on the application of customary law in Canada, Ghana, Kenya, Malawi

**EXTRA-CURRICULAR ACTIVITIES**

---

- McGill Institute for Health and Social Policy, *Research/Policy Fellow*** Jan. 2009 –Present
- Qualitative field research conducted in Cameroon on rural women’s group empowerment strategies
  - Conducted 49 interviews with group members, community leaders, project managers
  - Writing a case study to be published
- Black Law Students’ Association of McGill, *Vice-President External*** 2009-Present
- Coordinated community outreach initiatives
  - Mentored undergraduate students
- Educational Equity Committee - McGill Law Students Association, *Member*** 2009-Present
- Helped draft submission to McGill Task Force on Diversity, Excellence and Community Engagement
  - Initiated equity review in Law Faculty
- McGill Law Women’s caucus, *Member*** 2008-Present
- Village of Hope Orphanage – Kitwe, Zambia, *Volunteer*** Summer 2008
- Taught at community school; Organized sports camps
- Ottawa Community Immigration Services Organization, *Volunteer ESL Teacher*** 2007-2008
- Prepared and taught ESL lessons to recently immigrated individuals
- Centretown Emergency Food Centre (Ottawa), *Volunteer*** 2005-2006
- Carleton University varsity women’s soccer team, *Member*** 2004-2007
- Selected for Ontario University Athletics’ women’s inter-university All-Star soccer team
  - ‘Defensive Player of the Year’ Award

**SKILLS & INTERESTS**

---

- **Languages:** English; French
- **Interests:** International current events; Travel; Soccer; West-African dance

**Ontario Energy Board  
COST CLAIM FOR HEARINGS**



**Detail of Fees and Disbursements Being Claimed**

<b>File #</b> EB- <u>2012-0451-0433-0074</u>	<b>Process:</b> <u>Hearing re: Application for Leave to Conduct</u>
<b>Party:</b> <u>Council of Canadians</u>	<b>Name:</b> <u>Janine Lesperance</u>
Completed Years Practising/Years of relevant experience _____ _____	
<b>Counsel/Articling Student/Paralegal:</b> <input checked="" type="checkbox"/>	
<b>Consultant:</b> <input type="checkbox"/>	
<b>CV attached:</b> <input checked="" type="checkbox"/>	<b>CV not required:</b> <input type="checkbox"/>

**Statement of Fees Being Claimed**

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	35.80	\$100.00	\$3,580.00	\$465.40	\$4,045.40
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing			\$0.00	\$0.00	\$0.00
Argument	4.80	\$100.00	\$480.00	\$62.40	\$542.40
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			\$4,060.00	\$527.80	<b>\$4,587.80</b>

**Statement of Disbursements Being Claimed**

	Net Cost	HST	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air		\$0.00	\$0.00
Travel: Car		\$0.00	\$0.00
Travel: Rail		\$0.00	\$0.00
Travel (Other):		\$0.00	\$0.00
Parking		included	\$0.00
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation		\$0.00	\$0.00
Meals		\$0.00	\$0.00
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>		\$0.00	<b>\$0.00</b>

# JANINE LESPÉRANCE

4-91 MACLAREN STREET • OTTAWA, ON • K2P 0K5  
613-277-3131 • janine.lesperance@gmail.com

## EDUCATION

---

- Juris Doctor (J.D.) / Master of Arts (M.A.) [joint program]** 2009 - 2013  
*University of Ottawa Faculty of Law / Carleton University, Norman Paterson School of International Affairs, Ottawa, ON*  
- Specialization in international law / conflict analysis and resolution
- Bachelor of Arts with First-Class Honours** 2007  
*St. Francis Xavier University, Antigonish, NS*  
- Major in Political Science with Development Studies subsidiary  
- Dean's List 2003 - 2005, 2007  
- Top-ten ranking in Faculty of Arts 2003 - 2005
- Certificat d'Études Politiques** 2006  
*Institut d'Études Politiques de Lille, Lille, France*  
- Exchange program for full scholastic year

## AWARDS AND ACHIEVEMENTS

---

- Ontario Graduate Scholarship 2010 - 2011
- Carleton University 2010-2011 Graduate Scholarship, Dean of Graduate Studies Entrance Scholarship
- University of Ottawa Faculty of Law Public Interest Fellowship, Summer 2010

## LAW-RELATED EXPERIENCE

---

- Articling Student** 2013 - present  
*Sack Goldblatt Mitchell LLP, Ottawa, ON*  
- Researching case law and writing legal memoranda pertaining to labour law, public interest litigation  
- Preparing for legal presentations, assisting lawyers in hearings
- Legal Intern** 2011 - 2012  
*Canadian Centre for International Justice, and Amnesty International Canada, Ottawa, ON*  
- Investigated background information and legal principles for specific cases  
- Wrote memorandums and reports, including a report to the United Nations Committee Against Torture  
- Assisted with client intake by providing oral translation (English-French)  
- Monitored the Mungwarere Genocide / Crimes Against Humanity trial in Ottawa
- Volunteer 'Cooperant'** 2011  
*Public Prosecutor's Office, Human Rights Section, Special Unit for Civil War Cases, Guatemala City, Guatemala*  
- Researched international jurisprudence on genocide and wrote memorandum with recommendations  
- Led training presentation for prosecutors and legal assistants of the section  
- Supported organization of evidence (victim testimonies)  
- Observed criminal trial for Dos Erres massacre, as part of Avocats Sans Frontières Canada team
- Research Assistant** 2011  
*University of Ottawa Human Rights Research and Education Centre, Ottawa, ON*  
- Developed research methodology and conducted primary research on CEDAW treaty committee history  
- Compiled and condensed findings, identifying key trends

**Legal Intern**

2010

*Bufete Jurídico Popular de Rabinal (Rabinal Community Legal Clinic), Guatemala*

- Edited, drafted and translated proposals and petitions in support of civil war victims of Mayan communities
- Researched jurisprudence of Inter-American human rights system
- Supported development of investigation strategy and investigation for land rights cases

**Competitor**

2009

*Nelligan O'Brien Payne First Year Moot Court Competition, Ottawa, ON*

- Prepared factum based on case materials
- Presented arguments orally for mock panel of judges

**OTHER WORK EXPERIENCE**

---

**Highland Dancing Instructor**

2003, 2005, 2008 - 2010

*Ellen Cameron School of Dance, Bonville / Ottawa, ON*

- Assisted in teaching and individually taught dance lessons to groups of mixed ages and skill levels
- Choreographed group dances to be performed in competition
- Motivated students in private lessons while providing technical expertise

**English as a Foreign Language Teacher**

2007 - 2008

*Gungnae Public Elementary School, Gunpo, South Korea*

- Led regular classes with Korean co-teachers
- Planned and taught special advanced classes and adult class independently

**COMMUNITY INVOLVEMENT AND VOLUNTEER EXPERIENCE**

---

- Member, Law Union at the University of Ottawa 2011 - present
- Guatemala Committee member, *Avocats Sans Frontières Canada* 2010 - present
- Member, *Breaking The Silence Guatemala-Maritimes Solidarity Network* 2010 - present
- Intern, *CANADEM*, Ottawa, ON 2011
- Member, *UOttawa Chapter of Canadian Lawyers for International Human Rights (CLAIHR)* 2009 - 2010
- Las Tolas Community Volunteer Program, Ecuador 2009
- Perucho Organic Agriculture Experience volunteer program participant, Ecuador 2009
- Grant research team member, Canada-Africa Community Health Alliance, Ottawa, ON 2008 - 2009
- Event organizer and performer in Service Learning variety show fundraiser, Antigonish, NS 2007

**SKILLS AND PERSONAL INTERESTS**

---

**Languages:** Fluent in English, French, and Spanish

**Travel:** Traveled independently in Western Europe, Eastern Asia, Southeast Asia, and South America; participated in 2007 Service Learning trip to Cuernavaca Centre for Intercultural Dialogue on Development in Mexico

**Highland dancing:** Finalist at the 2005 World Championships; competed across Canada, USA, and Scotland; performed in the 2007 Royal Edinburgh Military Tattoo in front of 217,000 spectators and television audience of 100 million; certified as an instructor by the British Association of Teachers of Dance; currently compete on occasion, train regularly.

**Other fitness activities:** Have raced 10km and half-marathon distances; climbed Cotopaxi volcano in Ecuador; regularly do yoga and pilates

**Folk and Celtic cultural activities:** Play the fiddle and guitar; step-dance; occasionally participate in Ottawa Cape Breton Session musical events

**Ontario Energy Board  
COST CLAIM FOR HEARINGS**



**Detail of Fees and Disbursements Being Claimed**

File # EB- <u>2012-0451-0433-0074</u>	Process: <u>Hearing re: Application for Leave to Conduct</u>
Party: <u>Council of Canadians</u>	Name: <u>Marion Sandilands</u>
	Completed Years Practising/Years of relevant experience _____
Counsel/Articling Student/Paralegal: <input checked="" type="checkbox"/>	_____
Consultant: <input type="checkbox"/>	_____
CV attached: <input checked="" type="checkbox"/>	CV not required: <input type="checkbox"/>

**Statement of Fees Being Claimed**

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	21.80	\$100.00	\$2,180.00	\$283.40	\$2,463.40
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing			\$0.00	\$0.00	\$0.00
Argument			\$0.00	\$0.00	\$0.00
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			\$2,180.00	\$283.40	<b>\$2,463.40</b>

**Statement of Disbursements Being Claimed**

	Net Cost	HST	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air		\$0.00	\$0.00
Travel: Car		\$0.00	\$0.00
Travel: Rail		\$0.00	\$0.00
Travel (Other):		\$0.00	\$0.00
Parking		included	\$0.00
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation		\$0.00	\$0.00
Meals		\$0.00	\$0.00
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>		\$0.00	<b>\$0.00</b>

# Marion Sandilands

6097 ave Esplanade  
Montreal, QC  
438-821-8595  
marion.sandilands@mail.mcgill.ca

## EDUCATION

---

- 2011 –  
April 2014      **B.C.L. / LL.B Candidate (2<sup>nd</sup> year of 3 years)**  
McGill University, Montreal
- CGPA: 3.47 (Top 10%)
  - Hydro-Quebec Entrance Scholarship (2011); Fraser Milner Casgrain Scholarship (2011); Dean's Honour List (2012)
- 2006 – 2008      **M.A. International Affairs (International Development)**  
Norman Paterson School of International Affairs  
Carleton University, Ottawa
- Dean's Entrance Scholarship and Joubin-Selig Scholarship in International Affairs
- 2003 – 2006      **B.A. Hon. (International Development Studies)**  
McGill University, Montreal
- Minor concentration: Philosophy and Western Religions
  - First Class Honours, Dean's Honour List
  - First year completed at *College of the Humanities*, Carleton University, Ottawa

## LEGAL EXPERIENCE

---

- May 2012 –  
present      **McGill Law Journal**  
**Associate Editor**  
*Reviewing submissions in French and English (first reads), substantive editing (formal and substantive review of citations)*
- October 2012  
– present      **Prof Adelle Blackett**  
**Research Assistant**  
*Research for country case studies on regulation of decent work for domestic workers in the wake of the new ILO Convention 189*
- 2011 – 2012      **McGill International Journal of Sustainable Development Law and Policy**  
**Associate Editor**  
*Reviewed submissions (first and second reads), substantive editing of articles*
- 2012 (summer)      **Me Tatiana Gomez**  
**Intern / Assistant, Immigration & Refugee law (pro bono)**  
*Drafted permanent residency applications and appeal pleadings; prepared books of evidence for IRB refugee claims; research for refugee and immigration applications (jurisprudence and country conditions)*
- 2012 (summer)      **Legal Information Clinic at McGill**  
**Volunteer**  
*Interviewed clients in English and French; researched and answered clients' legal questions; prepared and delivered presentation on Employment Law to at-risk youth*

2011 – 2012      **Association des aides familiales du Québec (AAFQ)**  
**Pro Bono McGill volunteer**  
*Provided legal information to live-in caregivers (under federal temporary Live-In Caregiver program); prepared a toolkit on immigration rules; gave organizational support including outreach, correspondence, Board meetings*

---

## OTHER PROFESSIONAL EXPERIENCE

---

May 2012 --  
present      **Coordinator, Young Leaders Forum**  
**McGill Centre for Human Rights and Legal Pluralism**  
Montreal  
*Designed and organized an international selection process; designed Forum program to maximize participation and ownership by participants; designed activities to build a virtual community leading up to the Forum*

2009 – 2011      **Program Management Officer / Research Officer**  
**International Development Research Centre**  
Ottawa (travel to Senegal, Mexico, France and The Netherlands)  
*Coordinated an \$8-10M per year global research funding program. Managed and analyzed program information; advised Program Leader on operational and programming issues, recruited and supervised interns; lead program reporting and communications strategy.*

2007 – 2009      **Program Officer**  
**CHF – partners in rural development**  
Ottawa (travel to Kenya, Vietnam and Thailand)  
(promoted from **Development Intern** in 2008)  
*Administered and monitored rural livelihoods projects in Asia and Africa. Prepared and administered contracts and funding agreements, wrote proposals and progress reports, analyzed financial reports, prepared budgets*

---

## ACADEMIC RESEARCH & PUBLICATION

---

2008      Perez-Aleman, P. and Sandilands, M. “Building Value at the Top and the Bottom of the Global Supply Chain: MNC-NGO Partnerships that Include Small Producers in Developing Countries” *California Management Review*, Fall 2008

2008      Sandilands, M. “Supermarkets and small farmers: A Value chain analysis of the impact of supermarket procurement strategies on smallholder farmers – the case of Kenyan fresh fruits and vegetables.” Master’s Research Paper, Norman Paterson School of International Affairs, Carleton University, 2008.

2006      “The Appearance of Consensus: Public Sector Capacity Building in Tanzania” *Latitudes*, Vol. 1 (McGill International Development Studies Undergraduate Journal), 2006.

---

## HOBBIES & INTERESTS

---

**Music & Theatre**      McGill Savoy Society, Cantata Singers of Ottawa; Montreal Symphony Orchestra Chorus, National Arts Centre Orchestra Chorus, McGill Chamber Singers, Sock n Buskin Theatre

**Sports**      Field hockey, curling, tennis, running

**Travel**      Cambodia, France, Kenya, Thailand, The Netherlands, Senegal, UK, Vietnam

**Ontario Energy Board  
COST CLAIM FOR HEARINGS**



**Detail of Fees and Disbursements Being Claimed**

File # EB- <u>2012-0451-0433-0074</u>	Process: <u>Hearing re: Application for Leave to Construct</u>
Party: <u>Council of Canadians</u>	Name: <u>David Hughes</u>
Completed Years Practising/Years of relevant experience	_____
Counsel/Articling Student/Paralegal: <input type="checkbox"/>	_____
Consultant: <input checked="" type="checkbox"/>	_____
CV attached: <input checked="" type="checkbox"/>	CV not required: <input checked="" type="checkbox"/>

**Statement of Fees Being Claimed**

	Hours	Hourly rate	Subtotal	HST (5%)	Total
Preparation	40.75	\$330.00	\$13,447.50	\$672.38	\$14,119.88
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing	4.00	\$330.00	\$1,320.00	\$66.00	\$1,386.00
Argument			\$0.00	\$0.00	\$0.00
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			<b>\$14,767.50</b>	<b>\$738.38</b>	<b>\$15,505.88</b>

**Statement of Disbursements Being Claimed**

	Net Cost	HST (5%)	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air		\$0.00	\$0.00
Travel: Car	\$160.17	\$8.01	\$168.18
Travel: Rail		\$0.00	\$0.00
Travel (Other): <span style="margin-left: 20px;">Ferry</span>	\$102.74	\$5.14	\$107.88
Parking		included	\$0.00
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation	\$370.00	\$18.50	\$388.50
Meals	\$48.67	\$2.43	\$51.10
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>		<b>\$681.58</b>	<b>\$34.08</b>
			<b>\$715.66</b>



# GLOBAL SUSTAINABILITY RESEARCH INC.

PO Box 237, 780 Whaletown Road, British Columbia, V0P 1Z0

451-36<sup>th</sup> Avenue NW, Calgary, Alberta, T2K 0C4

GST/HST registration number 834974628

250-830-3662 403-276-3056

## INVOICE - #2014-010

January 13, 2013

**Steven Shrybman, Sack Goldblatt Mitchell LLP**

500-30 rue Metcalf St.

Ottawa, ON K1P 5L4

**RE: Preparation of Evidence, Response to Interrogatories, and Attendance  
at Enbridge, Union and TCPL Ontario Energy Board Hearings**

Total time spent per attached timesheet:

44.75 hours @ \$330.00/hour - \$14,767.50

Goods and Services Tax (5%) - \$738.38

**Total now due: \$15,505.88**

Please forward remittance to 451-36 Avenue NW, Calgary, AB, T2K 0C4

Thank You,

David Hughes

President

Date	Work	Time (hours)
Jun-25	Review applications to assess areas for response	1.00
Jun-25	Prepare evidence	3.00
Jun-26	Prepare evidence	8.00
Jun-27	Revise evidence and incorporate Union information	4.50
Jun-28	Revise evidence	1.50
Jul-10	Response to questions EB and Union	1.50
Jul-11	Response to questions EB and Union	5.75
Jul-12	Response to questions EB and Union	4.50
Jul-13	Response to questions EB and Union	4.00
Jul-14	Response to questions EB and Union	2.25
Jul-18	Review response to EB and Union and update	2.75
Jul-19	Finalize response to EB and Union	1.25
Aug-20	Response to TCPL queries	0.75
Oct-08	Preparation for hearing	1.50
Oct-09	Attendance and testimony at hearing	2.5
Total		44.75

Date	Item	Cost
Sep-29	Room in Campbell River - 1 night - first trip which was cancelled	\$83.62
Oct-03	Ferry Cortes Island to Campbell River return - first trip	\$58.05
Oct-07	Room in Campbell River - 4 nights (wife) - second trip for Oct 9 hearing	\$334.48
Oct-08	Taxi to airport Campbell River	\$31.00
Oct-08	Taxi to hotel Toronto	\$75.00
Oct-09	Lunch for T. Ingraffea, L. Sumi and myself including tip	\$55.00
Oct-10	Taxi to airport Toronto	\$60.00
Oct-10	Shuttle to motel from airport Campbell River	\$15.00
Oct-11	Ferry Cortes Island to Campbell River return - second trip	\$58.05
	Total	\$770.20

ROOM # 32 NAME \_\_\_\_\_

## GUEST REGISTRATION

NAME DAVE HUGHES PHONE H 250-830-3602

STREET \_\_\_\_\_ CITY \_\_\_\_\_ PROV./STATE \_\_\_\_\_ P.C./ZIP \_\_\_\_\_

COMPANY REPRESENTING \_\_\_\_\_

VEHICLE LICENSE NUM 478 PROVINCE/STATE \_\_\_\_\_

MAKE / COLOUR \_\_\_\_\_ YEAR \_\_\_\_\_

**NOTICE TO GUESTS:** This property is privately owned and management reserves right to refuse service to anyone and will not be responsible for accidents or injury to Guests or for loss of money, jewelry or valuables of any kind.

GUEST SIGNATURE X [Signature]

NO. IN PARTY	ARRIVAL DATE	CHECK-OUT DATE	ROOM TOTAL
2	10/07/13		\$ 296.00
			HST / GST
4			\$ 14.80
			PROV. ROOM TAX
			\$ 23.68
			SUBTOTAL
			\$
			\$
			CHARGES
			CREDITS
			<b>TOTAL</b>
			\$ 334.48

NO. OF DAYS 4 \$ RATE 74.00

DAYS OCCUPIED (✓)						
SUN	MON	TUES	WED	THUR	FRI	SAT
	✓	✓	✓	✓		

CASH  TRAVELLERS CHEQUE  
 VISA  M.C.  AMEX  DEBIT CARD

# \_\_\_\_\_  
 RECD BY \_\_\_\_\_

Check-out time is 11:00am  
 The person registering is responsible for all damages caused to room, furnishings and fixtures.

**ABOVE TIDE MOTEL**  
 361 Island Highway  
 Campbell River, B.C. V9W 2B5  
 (250) 286-6231 Fax (125) 028-6029

**THANK YOU**  
 This is your Receipt  
 Please Retain

ABOVE TIDE MOTEL  
 361 ISLAND HWY  
 CAMPBELL RIVE. BC

Term ID: 28083145

Purchase

XXXXXXXXXX6125

VISA

Entry Method: C

Total:

\$ 334.48

2013/10/07

14:15:20

Seq #: 0014970100

Appr Code: 056412

Resp Code: 01/027

VISA  
 A0000000031010  
 1C EB 2A FA CB 37 BE 15  
 00 00 00 80 00  
 74 91 68 58 87 EB 7A 47

APPROVED  
 Thank You

ROOM # 32 NAME \_\_\_\_\_

## GUEST REGISTRATION

NAME DAVE HUGHES PHONE H 250-830-3602

STREET 780 Whaletown Rd. Contec

CITY Whaletown PROV./STATE \_\_\_\_\_ P.C./ZIP \_\_\_\_\_

COMPANY REPRESENTING \_\_\_\_\_

VEHICLE LICENSE NUM 478 PROVINCE/STATE \_\_\_\_\_

MAKE / COLOUR \_\_\_\_\_ YEAR \_\_\_\_\_

**NOTICE TO GUESTS:** This property is privately owned and management reserves right to refuse service to anyone and will not be responsible for accidents or injury to Guests or for loss of money, jewelry or valuables of any kind.

GUEST SIGNATURE X [Signature]

NO. IN PARTY	ARRIVAL DATE	CHECK-OUT DATE	ROOM TOTAL
2	10/07/13		\$ 296.00
			HST / GST
4			\$ 14.80
			PROV. ROOM TAX
			\$ 23.68
			SUBTOTAL
			\$
			\$
			CHARGES
			CREDITS
			<b>TOTAL</b>
			\$ 334.48

NO. OF DAYS 4 \$ RATE 74.00

DAYS OCCUPIED (✓)						
SUN	MON	TUES	WED	THUR	FRI	SAT
	✓	✓	✓	✓		

CASH  TRAVELLERS CHEQUE  
 VISA  M.C.  AMEX  DEBIT CARD

# \_\_\_\_\_  
 RECD BY \_\_\_\_\_

Check-out time is 11:00am  
 The person registering is responsible for all damages caused to room, furnishings and fixtures.

**ABOVE TIDE MOTEL**  
 361 Island Highway  
 Campbell River, B.C. V9W 2B5  
 (250) 286-6231 Fax (125) 028-6029

**THANK YOU**  
 This is your Receipt  
 Please Retain

ABOVE TIDE MOTEL  
 361 ISLAND HWY  
 CAMPBELL RIVE. BC

Term ID: 28083145

Purchase

XXXXXXXXXX6125

VISA

Entry Method: C

Total:

\$ 334.48

2013/09/29

14:10:44

Seq #: 0014950030

Appr Code: 013595

Resp Code: 01/027

VISA  
 A0000000031010  
 94 46 02 30 58 24 04 EB  
 00 00 00 80 00  
 7B 04 0E 04 2F EE 6E 62

APPROVED  
 Thank You

2576

2603

32



**PURCHASE**  
**BCFerries**

2013/10/11  
 Campbell River  
 To  
 Cortes Island  
**PURCHASE**

20'	Undersize Vehi	47.95
2	Adult	41.10
1	UH Savings	15.60
2	Adult Savings	15.40

Total	58.05
BCF Experience	58.05
*** ** 335	
CHANGE DUE	0.00
Today's Savings	31.00

Stored Value  
 Savings:VEH & PASS Savings  
 Balance:\$6.65

**LANE 00**

CAM 11 Oct 2013 13:30



1047026 328199

SEE REVERSE SIDE OF TICKET

10-09-13

3 11:50

01 14.05

04 3.00

1 11.00

1 7.00

2 5.50

2 21.80

3 4.00

0.40

49.15

Lunch P -	14.
Sm Cer.	6.
Car P	11.
Car P	
Car P	7.
U CANADA.	5.50
<b>TAX</b>	
<b>PLEASE PAY CASHIER</b>	
C. 37795	GUESTS WAITER
	49.15

ART PRINTING CO. - (416) 751-9111 - TORONTO

**PURCHASE**



2013/10/03  
 Campbell River  
 To  
 Cortes Island  
**PURCHASE**

20'	Undersize Vehi	47.95
2	Adult	41.10
1	UH Savings	15.60
2	Adult Savings	15.40

Total	58.05
BCF Experience	58.05
*** ** 335	
CHANGE DUE	0.00
Today's Savings	31.00

Stored Value  
 Savings:VEH & PASS Savings  
 Balance:\$64.70

**LANE 00**

CAM 03 Oct 2013 11:52



1047026 264817

SEE REVERSE SIDE OF TICKET

ABOVE TIETS  
 TO  
 AIR PORT  
 8 oct 13  
 31.00

RECEIPT FOR CAB FARE Date 00oct 13  
 Amount 7.50  
 From Airport  
 To Best western  
 Cab No 109 Driver  
 THANK YOU  
 ABLE-ATLANTIC TAXI 298-1111

**TORONTO PEARSON AIRPORT - PRE ARRANGED PICKUP GUIDE**

Clear customs and pick-up luggage and proceed to Pre-Arrange post  
 Terminal 1 Proceed to Door B - Terminal 3: Proceed to Post 29.  
 See Commissionaire at designated Pre-Arrange post.  
 Please give your name to the commissionaire and  
 King Tours & Limousine Services  
 If Commissionaire tells you that there is no King Tours & Limousine Services  
 registered under your name, please call our office immediately to assist you at  
 647-776-0337 or toll free 1-866-5464-999.  
 King Tours & Limousine Services monitor each flight.  
 Date: 10/13/13 Amount \$ 31.00 Driver: [Signature]  
 Thank You

THE 287-TAXI CO.  
GST#121705926 RT

*July 10*

NOM NAME
ADRESSE ADDRESS

VENDEUR PAR SOLD BY	C.R. CCID	FACTURÉ CHARGE	ACRÉDIT NON ACCOUNT	QUANTITÉ AMOUNT
------------------------	--------------	-------------------	------------------------	--------------------

1				
2				
3				
4	<i>Shuttle</i>			
5	<i>from</i>			
6	<i>airport</i>			
7				
8				
9				
10				
			TPS/GST TVH/HST	
N° DE TAXE TAX REG. No.:			TVP/PST	
<i>13</i>			TOTAL	
	REÇU PAR RECEIVED BY	<i>[Signature]</i>		

LIVRET DE VENTE  
SALES BOOK

# Ontario Energy Board COST CLAIM FOR HEARINGS



## Detail of Fees and Disbursements Being Claimed

File # EB- <u>2012-0451-0433-0074</u>	Process: <u>Hearing re: Application for Leave to Construct</u>
Party: <u>Council of Canadians</u>	Name: <u>Lisa Sumi</u>
Completed Years Practising/Years of relevant experience	_____
Counsel/Articling Student/Paralegal: <input type="checkbox"/>	_____
Consultant: <input checked="" type="checkbox"/>	_____
CV attached: <input checked="" type="checkbox"/>	CV not required: <input type="checkbox"/>

### Statement of Fees Being Claimed

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	34.00	\$230.00	\$7,820.00	\$1,016.60	\$8,836.60
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing	4.00	\$230.00	\$920.00	\$119.60	\$1,039.60
Argument			\$0.00	\$0.00	\$0.00
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			<b>\$8,740.00</b>	<b>\$1,136.20</b>	<b>\$9,876.20</b>

### Statement of Disbursements Being Claimed

	Net Cost	HST	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air	\$1,188.57	\$154.51	\$1,343.08
Travel: Car		\$0.00	\$0.00
Travel: Rail		\$0.00	\$0.00
Travel (Other):		\$0.00	\$0.00
Parking		included	\$0.00
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation	\$212.35	\$27.61	\$239.96
Meals	\$25.51	\$3.32	\$28.83
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>	<b>\$1,426.43</b>	<b>\$185.44</b>	<b>\$1,611.87</b>

**LISA SUMI**

1846 C.R. 207 DURANGO, COLORADO 81301

TELEPHONE: 970-799-1326 • EMAIL: lsumi@earthworksaction.org

**INVOICE****Date:** January 11, 2013**To: Council of Canadians**

Attn: Steven Shrybman, Sack Goldblatt Mitchell LLP

500-30 rue Metcalf St.

Ottawa, ON K1P 5L4

**From:** Lisa Sumi**For:** Testimony prepared on behalf of Council of Canadians for Ontario Energy Board Hearing (Re: Enbridge/Union Applications EB-2012-0451/EB-2012-0333).

Date	Details	Amount
June	Research and writing of report prepared for Council of Canadians as part of their submission to the Ontario Energy Board hearing regarding Enbridge/Union Applications EB-2012-0451/EB-2012-0433. (32 hours)  Total: 32 hours @ \$230/hr	\$7,360.00
July - August	Preparation of interrogatory responses, and responses to new TCPL evidence. (2 hours)  Total: 2 hours @ \$230/hr	\$460.00
October	Conference calls and in-person meetings with Council of Canadians in preparation for the OEB stakeholder meeting (3 hours)  Oct. 9, 2013: Appearance at Ontario Energy Board Oral Hearing for cross-examination related to testimony on Applications EB-2012-0451/EB-2012-0433. (1 hours)  Total: 4 hours @ \$230/hr	\$920.00
<b>Invoice Total</b>		
		<b>Total \$8,740.00</b>

**Please send a cheque for this invoice to Lisa Sumi at:**

1846 C.R. 207  
Durango, CO 81301

**LISA SUMI**

1846 C.R. 207 DURANGO, COLORADO 81301

TELEPHONE: 970-799-1326 • EMAIL: lsumi@earthworksaction.org

US dollars

-exchange rate = 1.11  
(Bank of Canada rate  
as of Feb. 4/14)

## INVOICE

**Date:** October 15, 2013

**To:** Steven Shrybman, Sack Goldblatt Mitchell LLP  
500-30 rue Metcalf St.  
Ottawa, ON K1P 5L4

**From:** Lisa Sumi

**For:** Air fare, ticket change and meals related to the October 9, 2013 Ontario Energy Board Hearing (Re: EB-2012-0451 and EB-2012-0333).

Details		Amount (US\$)
9/5/13	Original ticket for air fare from Durango, Colorado to Toronto, Ontario. (Receipt attached)	680.81
10/1/13	Ticket change for rescheduled OEB hearing (Receipt attached)	529.18
10/9/13	Supper Oct. 9, 2013 (19.95 Cdn = 19.17 U.S.) <sup>1</sup> (Receipt attached)	19.17
10/10/13	Hotel Oct. 9, 2013 (224.87 Cdn = 216.17 U.S.) <sup>2</sup> (Receipt attached)	216.17
10/10/13	Meals during travel back to Durango (Receipt attached)	6.80
<b>Total</b>		<b>\$1,452.13</b>

755.70 Cdn.  
587.39 Cdn.

21.28 Cdn.

239.95 Cdn.

7.55 Cdn

1611.87 Cdn.

**Please forward payment as a \$US money order, to:**

Lisa Sumi, 1846 C.R. 207 Durango, CO 81301

<sup>1</sup> Supper of \$19.95 paid in Canadian dollars. Exchange rate for that day was 0.9608 (Bank of Canada: <http://www.bankofcanada.ca/rates/exchange/can-us-rate-lookup/>), so in U.S. dollars  $19.95 \times 0.9608 = \$19.17$ .

<sup>2</sup> Hotel fee of \$224.87 was charged in Canadian dollars. Exchange rate for that day was 0.9613 (Bank of Canada: <http://www.bankofcanada.ca/rates/exchange/can-us-rate-lookup/>), so in U.S. dollars  $224.87 \times 0.9613 = \$216.17$  U.S.



A STAR ALLIANCE MEMBER

Confirmation:  
**EN1T0X**  
[Check-In >](#)

Issue Date: September 05, 2013

<b>Traveler</b>	<b>eTicket Number</b>	<b>Frequent Flyer</b>	<b>Seats</b>
SUMI/LISAMS	0162379037591	UA-AGT7XXXX	14C/38F/---/---/32B/---

**FLIGHT INFORMATION**

Day, Date	Flight	Class	Departure City and Time	Arrival City and Time	Aircraft	Meal
Thu, 19SEP13	UA4922	S	DURANGO, CO (DRO) <b>5:45 AM</b>	DENVER, CO (DEN) <b>7:00 AM</b>		Q400

Flight operated by REPUBLIC AIRLINES doing business as UNITED EXPRESS with turboprop equipment.

Thu, 19SEP13	UA358	S	DENVER, CO (DEN) <b>8:17 AM</b>	NEW YORK, NY (LGA - LAGUARDIA) <b>1:59 PM</b>		757-200 Purchase
--------------	-------	---	------------------------------------	--	--	------------------

Thu, 19SEP13	UA8403	L	NEW YORK, NY (LGA - LAGUARDIA) <b>3:30 PM</b>	TORONTO, ON CANADA (YYZ) <b>5:14 PM</b>		ERJ 190
--------------	--------	---	--	--	--	---------

Flight operated by AIR CANADA.

If this is an originating flight on your itinerary, please check in at the AIR CANADA ticket counter.

Wed, 02OCT13	UA8134	L	TORONTO, ON CANADA (YYZ) <b>9:40 AM</b>	CHICAGO, IL (ORD - O'HARE) <b>10:21 AM</b>		ERJ 175
--------------	--------	---	--	---	--	---------

Flight operated by AIR CANADA.

If this is an originating flight on your itinerary, please check in at the AIR CANADA ticket counter.

Wed, 02OCT13	UA675	K	CHICAGO, IL (ORD - O'HARE) <b>12:03 PM</b>	DENVER, CO (DEN) <b>1:37 PM</b>		757-200 Purchase
--------------	-------	---	---	------------------------------------	--	------------------

Wed, 02OCT13	UA4875	K	DENVER, CO (DEN) <b>3:43 PM</b>	DURANGO, CO (DRO) <b>4:56 PM</b>		Q400
--------------	--------	---	------------------------------------	-------------------------------------	--	------

Flight operated by REPUBLIC AIRLINES doing business as UNITED EXPRESS with turboprop equipment.

**FARE INFORMATION**

**Fare Breakdown**

Airfare:	532.94USD
U.S. Customs User Fee:	5.50
U.S. Immigration User Fee:	7.00
U.S. APHIS User Fee:	5.00
U.S. Federal Transportation Tax:	39.97
U.S. Flight Segment Tax:	23.40
September 11th Security Fee:	10.00
Canadian Security Charge:	12.10
Canada Harmonized Sales Tax:	3.10
Canada Airport Improvement Fee:	23.80
U.S. Passenger Facility Charge:	18.00
Per Person Total:	680.81USD

**Form of Payment:**

VISA  
Last Four Digits 3643

**eTicket Total: 680.81USD**

The airfare you paid on this itinerary totals: 532.94 USD

**The taxes, fees, and surcharges paid total: 147.87 USD**

Fare Rules: Additional charges may apply for changes in addition to any fare rules listed.

NONREF/OVALUAFTDPT/CHGFEE

Cancel reservations before the scheduled departure time or TICKET HAS NO VALUE.



A STAR ALLIANCE MEMBER

Confirmation: EN1T0X Check-In >

Issue Date: October 01, 2013

Traveler SUMI/LISAMS eTicket Number 0162381979717 Frequent Flyer UA-AGT7XXXX Seats ----/----/----/----

FLIGHT INFORMATION

Table with columns: Day, Date, Flight, Class, Departure City and Time, Arrival City and Time, Aircraft Meal. Rows include flights UA4922 S, UA358 S, UA8403 L, UA3452 H, and UA4927 H.

FARE INFORMATION

Table with columns: Fare Breakdown, Form of Payment. Rows include Airfare (846.87USD), U.S. Customs User Fee (5.50), U.S. Immigration User Fee (7.00), U.S. APHIS User Fee (5.00), U.S. Federal Transportation Tax (63.52), U.S. Flight Segment Tax (19.50), September 11th Security Fee (10.00), Canadian Security Charge (12.10), Canada Harmonized Sales Tax (3.20), Canada Airport Improvement Fee (23.80), U.S. Passenger Facility Charge (13.50), Per Person Total (1,009.99USD).

eTicket Total: 1,009.99USD

The airfare you paid on this itinerary totals: 846.87 USD

The taxes, fees, and surcharges paid total: 163.12 USD

Fare Rules: Additional charges may apply for changes in addition to any fare rules listed.

NONREF/0VALUAFTDPT/CHGFEE
Cancel reservations before the scheduled departure time or TICKET HAS NO VALUE.

Add Collect: An additional amount for the difference in fare was charged to VISA VIXXXXXXXXXXXXX3643 on Tuesday, October 01, 2013. \$329.18 USD per ticket for an additional total of \$329.18 USD was collected.

Additional Charges: Tue, Oct 1, 2013/Visa 3643 was charged 200.00 USD for the following: Change Penalty Fee / EDD 01629264245814



TORONTO

33 Gerrard Street West, Toronto, Ontario, M5G 1Z4  
 Tel: 416-595-1975 Fax: 416-581-8934

Ms Lisa Sumi  
 1846 County Road 207  
 Durango CO 81301  
 United States

Room: 2425  
 Folio: 1953191  
 Cashier: 24  
 Arrival: 10/09/13  
 Departure: 10/10/13  
 Reference:  
 Booking Ref. #:

Date	Description	Additional Information	Charges	Credits
10/09/13	Room Charge		199.00	
10/09/13	Room - HST 13%		25.87	
10/10/13	Visa	XXXXXXXXXXXX3643 XX/XX		230.84
10/10/13	Visa	credit back due to DMP adjustment XXXXXXXXXXXX3643 XX/XX		-5.97

<b>HST Summary</b>		Total	224.87	224.87
Registration No:	887925881	Balance Due	0.00	CDN
Room	25.87			
F&B	0.00			
Other	0.00			
<b>Total</b>	<b>25.87</b>			

Queen Mother Cafe  
 203 Queen Street W.  
 Toronto, Ontario  
 416 596-4719  
 HST #R104547781  
 Table #206  
 Trans#: 653218 Serv: 112  
 10/09/2013 10:10:29 PM #Cust:2

SSP America  
 Boccone Pronto T1  
 Lester B. Pearson Intl Airport  
 GST # 825875560RT001  
 416-776-2477

Qty	Description	Cost
2	Organic Char d gis	\$20.00
2	Mill St. Organic	\$11.50
1	Sticky Rice	\$5.95
1	Tacos	\$13.95
1	PadThai Vegetarian	\$13.95
<b>Net Total:</b>		<b>\$71.35</b>
HST		\$9.28

477 GURMIT W

Chk 6289	Oct10'13 10:43A	Gst 0
<b>**TO GO**</b>		
1 Breakfast Panini		6.00
Cash		7.00
Food		6.00
HST Tax		0.78
Payment		6.80
Change Due		0.20

**TOTAL : \$80.63**  
 Food: \$39.85  
 Liquor: \$31.50  
**Amount Due: \$80.63**

Guest Signature: \_\_\_\_\_  
 I agree that my liability for this bill is for any part of or the full amount

FEEDBACK  
 Dish Up Your Experience.  
 We appreciate feedback

# LISA SUMI

ADDRESS: 1846 CR 207 DURANGO, CO 81301  
TELEPHONE: (970) 799-1326 • EMAIL: lisasumi@gmail.com

## EDUCATION AND TRAINING

---

*Managing Environmental and Social Concerns in Mining* – 3-week course, Royal Roads University, Victoria, BC (June, 2000)

*Master of Science* – Physical Geography/Soil Science, University of Toronto (1997)

*Bachelor of Science* – Environmental Science/Physical Geography, U. Toronto (1995)

## WORK HISTORY

---

ENERGY/EXTRACTIVE INDUSTRIES RESEARCH CONSULTANT, 2007 - present.  
The majority of recent work involves the production of research reports used internally or published by clients. Areas of expertise include: analysis of regulatory and policy measures related to energy and extractive industries (hardrock minerals, coal, tar sands, natural gas, oil); analysis and synthesis of scientific data, government records and industry or academic reports; and production of information related to environmental, social and health impacts and options for minimizing effects related to energy and extractive industries.

Recent clients include: As-You-Sow; Council of Canadians; Earthworks; ForestEthics; Initiative for Responsible Mining Assurance; Massachusetts Institute of Technology Center for Future Civic Media; MiningWatch Canada; and Natural Resources Defense Council.

RESEARCH DIRECTOR, EARTHWORKS OIL AND GAS ACCOUNTABILITY PROJECT, 2004 – 2007. (Durango, CO). Responsibilities included researching oil and gas impacts and technologies to minimize impacts; preparing technical materials on oil and gas regulations and development proposals; and providing community support on water, air and soil contamination, noise, and landowner rights.

ENERGY/EXTRACTIVE INDUSTRIES RESEARCH CONSULTANT, 2002-2004 and part-time COORDINATOR OF THE WESTERN MINING ACTION NETWORK.

RESEARCH DIRECTOR, ENVIRONMENTAL MINING COUNCIL OF BRITISH COLUMBIA. 1998 -2002 (Victoria, BC). Responsibilities included research on mining and its effects on the environment and communities; creation of policy documents and educational materials; community outreach; and technical review of mine proposals and projects.

## PUBLICATIONS AND REPORTS

---

Steinzor, N., Subra, W. and Sumi, L. 2013. "Investigating Links Between Shale Gas Development and Health Impacts Through a Community Survey Project In Pennsylvania," *New Solutions: A Journal of Environmental and Occupational Health Policy*, Vol. 23(1). Available at: <http://baywood.metapress.com/link.asp?id=k243k37712348302>

Gestring, B. and Sumi, L. 2013. *Polluting the Future – how mining companies are polluting our nation's waters in perpetuity*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/files/publications/Health-Report-Full-FINAL-sm.pdf>

- Steinzor, N., Subra, W. and Sumi, L. 2013. *Gas Patch Roulette*. (Prepared for Earthworks). Available at: <http://www.earthworksaction.org/files/publications/Health-Report-Full-FINAL-sm.pdf>
- Sumi, L. 2012. *Breaking All the Rules – the crisis in oil and gas regulatory enforcement*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/files/publications/FINAL-US-enforcement-sm.pdf>
- Sumi, L. 2012. *Report on the Shortcomings of Exxon Mobil’s “Basis for Exclusion” of As You Sow’s Shareholder Resolution on Hydraulic Fracturing and Related Natural Gas Development* (Prepared for As You Sow) Internal document.
- Sumi, L. 2012. *Draft Standard on Free, Prior and Informed Consent*. (Prepared for the Initiative for Responsible Mining Assurance) Internal document.
- Sumi, L. 2010. *Environmental Concerns and Regulatory Initiatives Related to Hydraulic Fracturing in Shale Gas Formations*. (Prepared for Council of Canadians) Available at: <http://canadians.org/energy/documents/fracking/report-fracturing-1010.pdf>
- Sumi, L. 2008. *Mining and Health: A Community-centred Health Assessment Toolkit*. (Prepared for MiningWatch Canada) Available at: <http://www.miningwatch.ca/publications/mining-health-community-centred-health-assessment-toolkit>
- Sumi, L. 2008. *Shale Gas: Focus on the Marcellus Shale*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/pubs/OGAPMarcellusShaleReport-6-12-08.pdf>
- Sumi, L. 2007. *Report on Air Sampling Conducted in Monroe, Conecuh and Escambia Counties, Alabama*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/publications.cfm>
- Sumi, L. 2005. *Our Drinking Water at Risk - What EPA and the oil and gas industry don’t want us to know about hydraulic fracturing*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/publications.cfm?pubID=90>
- Sumi, L. 2004. *Oil and Gas at Your Door? A landowner’s guide to oil and gas development*. (Prepared for Earthworks) Available at: <http://www.earthworksaction.org/publications.cfm?pubID=91>
- Moodie, S., Sumi, L. and Thomsen, S. 2002. *Lesson Learned on Community Involvement in the Remediation of Abandoned Contaminated Sites*. (Prepared for the Canadian National Orphaned/Abandoned Mines Working Group).
- Campbell, K., Young, A. and Sumi, L. 2001. *Undermining the Law -- Addressing the Crisis in Compliance with Environmental Mining Laws in BC* (West Coast Environmental Law/Environmental Mining Council of British Columbia) Available at <http://www.wcel.org/wcelpub/2001/13569.pdf>
- Sumi, L. 2001. (Contributed chapter on environmental impacts) *Beneath the Surface – Aboriginal Law and Mining Rights in British Columbia* (Prepared for Environmental-Aboriginal Guardianship through Law and Education)

# Ontario Energy Board COST CLAIM FOR HEARINGS



## Detail of Fees and Disbursements Being Claimed

File # EB- <u>2012-0451-0433-0074</u>	Process: <u>Hearing re: Application for Leave to Construct</u>
Party: <u>Council of Canadians</u>	Name: <u>Anthony Ingraffea</u>
Completed Years Practising/Years of relevant experience	
Counsel/Articling Student/Paralegal: <input type="checkbox"/>	_____
Consultant: <input checked="" type="checkbox"/>	_____
CV attached: <input checked="" type="checkbox"/>	CV not required: <input checked="" type="checkbox"/>

### Statement of Fees Being Claimed

	Hours	Hourly rate	Subtotal	HST	Total
Preparation	8.50	\$330.00	\$2,805.00	\$364.65	\$3,169.65
Attendance - Technical Conference			\$0.00	\$0.00	\$0.00
Attendance - Settlement Conference			\$0.00	\$0.00	\$0.00
Attendance - Oral Hearing	6.00	\$330.00	\$1,980.00	\$257.40	\$2,237.40
Argument			\$0.00	\$0.00	\$0.00
Case Management		\$170.00	\$0.00	\$0.00	\$0.00
<b>TOTAL LEGAL/CONSULTANT FEES</b>			\$4,785.00	\$622.05	\$5,407.05

### Statement of Disbursements Being Claimed

	Net Cost	HST	Total
Photocopies		\$0.00	\$0.00
Printing		\$0.00	\$0.00
Fax		\$0.00	\$0.00
Courier		\$0.00	\$0.00
Telephone		\$0.00	\$0.00
Postage		\$0.00	\$0.00
Transcripts		\$0.00	\$0.00
Travel: Air	\$953.53	\$123.96	\$1,077.49
Travel: Car	\$117.88	\$15.32	\$133.20
Travel: Rail		\$0.00	\$0.00
Travel (Other):		\$0.00	\$0.00
Parking	\$8.64	included	\$8.64
Taxi or Airport Limo		\$0.00	\$0.00
Accommodation		\$0.00	\$0.00
Meals		\$0.00	\$0.00
Other:		\$0.00	\$0.00
<b>TOTAL DISBURSEMENTS:</b>	\$1,080.05	\$139.28	\$1,219.33

February 4, 2014

**Invoice # 1**

**TO: Steven Shrybman, Esq.**

**FROM: Dr. A. R. Ingraffea**

**REF: EB-2012-0451: Enbridge Gas Distribution Inc.; and EB-2012-0333 and EB-2013-0074: Union Gas Limited**

Below I claim my time spent for my preparation for, and attendance at, the hearing before the Ontario Energy Board, October 9, 2013:

- I. Preparation of my report entitled, “The Carbon Footprint of Shale Gas Development and the Remedial Measures Necessary to Address It”, and for responding to resulting interrogatories:  
8.5 Hours
  
- II. Meeting with you on the eve of hearing and again the following morning, and for attending the hearing itself:  
6 hours

**TOTAL HOURS CLAIMED BY THIS INVOICE**

**14.5**

**Thank you.**

US Dollars  
- exchange rate = 1.11  
(Bank of Canada  
rate as of  
Feb. 7/14)

**From:** Steven Shrybman  
**Sent:** October 14, 2013 7:26 PM  
**To:** 'ari1@cornell.edu'  
**Cc:** Lisa Purdy  
**Subject:** Re: receipts

---

**From:** Anthony R. Ingraffea [mailto:ari1@cornell.edu]  
**Sent:** Sunday, October 13, 2013 09:19 PM  
**To:** Steven Shrybman  
**Cc:** Anthony R. Ingraffea <ari1@cornell.edu>  
**Subject:** receipts

Hi Steven

I am sending you by surface mail receipts for:

1. Air Fare \$730.71 = 811.09 Cdn
2. Taxi (2) \$ 120.00 = 133.20 Cdn.
3. Parking in Ithaca \$7.79 8.64 Cdn.

→ 266.40 Cdn

I would also appreciate reimbursement for the cancellation and re-booking fee of \$240.00 which I will be charged when I use the cancelled airfare (notice is included with receipts).

ALREADY SENT

This brings a total of US \$1098.50

Please send to

A. R. Ingraffea  
309 Cayuga heights Road  
Ithaca, NY  
14850  
USA

WRT a fee, as we discussed a donation to

Physicians, Scientists, and Engineers for Healthy Energy, Inc.

a 501c.3 not-for-profit, would be greatly appreciated. One can use the DONATE button at

[www.psehealthyenergy.org](http://www.psehealthyenergy.org)

or send a check to

PSE, Inc.  
C/O Dr. Adam Law  
404 North Cayuga Street  
Ithaca, NY  
14850  
USA

Again, thank you, and look forward to seeing the final documents and hearing of the outcome.

best

tony

A. R. Ingraffea, Ph.D., P.E.  
Dwight C. Baum Professor of Engineering  
Weiss Presidential Teaching Fellow  
Cornell University  
[www.cfg.cornell.edu](http://www.cfg.cornell.edu)  
President: Physicians, Scientists, and Engineers for Healthy Energy, Inc.  
[www.psehealthyenergy.org](http://www.psehealthyenergy.org)  
607-351-0043

---



# Travelocity Confirmation

Travelocity Customer Support [travelocity@travelocity.com]

Sent: Tuesday, October 01, 2013 2:50 PM

To: Anthony R. Ingraffea

\*\*\*\*\*  
THANK YOU! Travel Reservation Confirmation  
\*\*\*\*\*

Dear Anthony R,  
Thank you for booking your travel through Travelocity.

Your trip to Toronto, ON Canada (YYZ) is confirmed. A summary of your reservation is provided below. Please be sure to:

- > Review your trip details
- > Confirm your special request or meal request with the airline
- > Read the instructions and policies listed below
- > Print this email for your records

Your Travelocity Trip ID is: 3327 4688 8988

Your phone number for this trip: 607-351-0043

Ticket(s) issued on Tue, Oct 1, 2013 at 01:49 PM CST.

This is an e-ticket, so no paper ticket will be sent. In addition, flight schedules may be changed by the airline.

What is an e-ticket? [http://svc.travelocity.com/info/info\\_popup\\_sa/0,,TRAVELOCITY:EN|ETICKETS,00.html](http://svc.travelocity.com/info/info_popup_sa/0,,TRAVELOCITY:EN|ETICKETS,00.html)

\*\*\*\*\*  
ITINERARY  
\*\*\*\*\*

Primary Contact: Anthony R Ingraffea

> Online check-in: <http://leisure.travelocity.com/Promotions/0,,TRAVELOCITY|1741|air main,00.html>.

> Lookup flight status: <http://dps1.travelocity.com/dparrqst.ctl?Service=TRAVELOCITY>.

> Change/cancel reservation: <http://www.travelocity.com/>

---

Flight: 1 Round-Trip Ticket  
All flight times are local to each city.

---

For your boarding pass, use reference code LYB9B9 for online or airport checkin.

Tue, Oct 8, 2013

Ithaca, (ITH) to Toronto Lester B Pearson International Airport, (YYZ)

Flight: United Flight 4828 operated by COMMUTAIR DBA UNITED EXPRESS (on De Havilland Canada DHC-8 Dash 8-200)  
Depart: 04:55 PM, Ithaca, NY (ITH)  
Arrive: 06:08 PM, Newark, NJ (EWR)

Requested Seats: 3E

1 Stop - change planes in Newark, (EWR)  
Connection Time: 2 hrs 47 mins

Flight: United Flight 8567 operated by AIR CANADA EXPRESS - SKY REGIONAL (on Embraer EMB 175 Jet)  
Depart: 08:55 PM, Newark, NJ (EWR)  
Arrive: 10:28 PM, Toronto, ON Canada (YYZ)  
Please check in with AIR CANADA

Total Travel Time: 5 hrs 33 mins

---

For your boarding pass, use reference code BCZ5VZ for online or airport checkin.

Wed, Oct 9, 2013

Toronto Lester B Pearson International Airport, (YYZ) to Ithaca, (ITH)

Flight: US Airways Flight 3771 operated by US AIRWAYS EXPRESS-AIR WISCONSIN (on Canadair Regional Jet)  
Depart: 05:59 PM, Toronto, ON Canada (YYZ)  
Arrive: 07:41 PM, Philadelphia, PA (PHL)  
Please check in with US AIRWAYS

Requested Seats: 7F

1 Stop - change planes in Philadelphia, (PHL)  
Connection Time: 1 hr 59 mins

Flight: US Airways Flight 4188 operated by US AIRWAYS EXPRESS-PIEDMONT AIRLINES (on De Havilland Canada DHC-8 Dash 8 all models)  
Depart: 09:40 PM, Philadelphia, PA (PHL)  
Arrive: 10:44 PM, Ithaca, NY (ITH)  
Please check in with US AIRWAYS

Total Travel Time: 4 hrs 45 mins

---

Passenger Name: ANTHONY R INGRAFFEA

Frequent Flyer Information: You can add your frequent flyer number at the airport.

Ticket Number: 0167310141116

\*\*\*\*\*  
TSA Travel Information  
\*\*\*\*\*

The TSA has determined that liquids, aerosols and gels, in limited quantities, are safe to bring aboard an aircraft. When packing, please follow these guidelines:

- >All liquids, gels and aerosols must be in 3.4 ounce (100ml) or smaller bottles.
- >All containers must fit in one quart-sized, clear, plastic, zip-top bag.
- >Each passenger is allowed only one bag.
- >Each bag must be placed in its own screening bin and X-rayed separately.
- >If you are carrying on larger amounts of prescriptions liquid medications, baby formula, and/or diabetic glucose treatments, you must declare these at the security checkpoint.

Arrive at the airport early. Enhanced security measures may mean longer lines at security checkpoints.

This new security policy applies to all domestic and international flights departing from U.S. airports. We always recommend checking the TSA Web site ([www.tsa.gov](http://www.tsa.gov)) for the most up-to-date information about security procedures. If you are departing from a non-U.S. airport, be sure to check that airport's security policies and pack accordingly.

\*\*\*\*\*  
COMPLETE YOUR TRIP PLANS!  
\*\*\*\*\*

Add a Hotel: <http://www.travelocity.com/Hotels/0,,TRAVELOCITY,00.html>

Add a Car: <http://www.travelocity.com/Cars/0,,TRAVELOCITY|Y,00.html>

\*\*\*\*\*  
INSTRUCTIONS AND POLICIES  
\*\*\*\*\*

#### General Policies

- > Tickets cannot be refunded or transferred unless otherwise noted. Name changes are not permitted.
- > Valid, government-issued ID is mandatory for you to get through security and board your flight.
- > Initial prices subject to change before final payment. Post-purchase increases of government-imposed taxes or fees may apply.
- > Prices do not include any applicable baggage fees.
- > International flights may be treated with insecticides. Details.
- > Other rules and restrictions may apply to this fare. Read fare rules.
- > Please review important terms & conditions of travel which may limit your legal rights.

Valid, government-issued ID Link : [http://www.tsa.gov/travelers/airtravel/acceptable\\_documents.shtm](http://www.tsa.gov/travelers/airtravel/acceptable_documents.shtm)

Baggage fee Link : [http://www.travelocity.com/info/info\\_popup/0,,TRAVELOCITY:EN%7CBAG\\_FEES,00.html](http://www.travelocity.com/info/info_popup/0,,TRAVELOCITY:EN%7CBAG_FEES,00.html)

Insecticides details Link : <http://www.dot.gov/office-policy/aviation-policy/aircraft-disinsection-requirements>

Fare rules Link : <http://travel.test.travelocity.com/flights>

/AirFareRules.do;?fare basis cd=QA7FN&dep arp cd=YYZ&arr arp cd=YYZ&aln cd=UA&dep dt=10/08/2013

Terms & Conditions of Travel link : [http://www.travelocity.com/info/info\\_popup/0,,TRAVELOCITY:EN%7CABOUT ETKT,00.html](http://www.travelocity.com/info/info_popup/0,,TRAVELOCITY:EN%7CABOUT ETKT,00.html)

#### Change Policies

- > Your ticket is non-refundable.
- > If you change your reservation, airlines may charge a fee to use your ticket as credit for a new reservation. This fee varies by airline, market, and specific fare rules, and may be \$150 or more for domestic tickets and \$200 or more for international tickets.
- > Some tickets do not allow any changes.
- > Need to change or cancel your trip? Use our online calculator ([http://travel.travelocity.com/mystuff/MyStuffControllerInit.do?target\\_page=MyTrips&Service=TRAVELOCITY](http://travel.travelocity.com/mystuff/MyStuffControllerInit.do?target_page=MyTrips&Service=TRAVELOCITY)) to check the fees and rules before you decide.

#### Cancellation Policies

- > Your ticket is non-refundable.
- > If you cancel you will not receive any money back.
- > You may be eligible to apply part of your ticket price towards future travel (for a limited time, usually a year).
- > If you cancel your reservation, airlines usually deduct \$150 or more for domestic tickets and \$200 or more for international tickets before determining the amount that can be applied towards future travel.
- > Need to change or cancel your trip? Use our online calculator ([http://travel.travelocity.com/mystuff/MyStuffControllerInit.do?target\\_page=MyTrips&Service=TRAVELOCITY](http://travel.travelocity.com/mystuff/MyStuffControllerInit.do?target_page=MyTrips&Service=TRAVELOCITY)) to check the fees and rules before you decide.

#### Domestic Flight Notice

- > Air transportation to be provided between points in the U.S. (including its overseas territories and possessions) is subject to the individual contract terms (including rules, regulations, tariffs and conditions) of the transporting air carriers, which are herein incorporated by reference and made part of the contract of carriage.
- > Where this coupon is issued for transportation, or services other than air travel, specific terms and conditions may apply. These terms and conditions may be included in the ticket set or may be obtained from the issuing company or agent.
- > Please make sure you have reviewed the important legal notice entitled "Conditions of Contract", "Notice of Incorporated Terms", "Notice of Baggage Liability Limitations", and "Notice of Overbooking" in Terms & Conditions of Travel or the specific terms and conditions relating to non-air transportation or services.
- > The Terms & Conditions of Travel will also be available at the airport prior to your flight departure.

Terms & Conditions of Travel link: [http://svc.travelocity.com/info/info\\_popup\\_sa/0,,TRAVELOCITY:EN|ABOUT ETKT,00.html](http://svc.travelocity.com/info/info_popup_sa/0,,TRAVELOCITY:EN|ABOUT ETKT,00.html).

#### International Flight (Warsaw Convention) Notice

- > If the passenger's journey involves an ultimate destination or stop in a country other than the country of departure, the Warsaw Convention may be applicable and

the Convention governs and in most cases limits the liability of carriers for death or personal injury and for the loss of or damage to baggage.

> See also the notices entitled "Advice to International Passengers on Limitation of Liability" and "notice of Baggage Liability Limitations" in Terms & Conditions of Travel

Terms & Conditions of Travel link: [http://svc.travelocity.com/info/info\\_popup\\_sa/0,,TRAVELOCITY:EN|ABOUT ETKT,00.html](http://svc.travelocity.com/info/info_popup_sa/0,,TRAVELOCITY:EN|ABOUT ETKT,00.html).

\*\*\*\*\*  
PRICING  
\*\*\*\*\*

1 adult: \$626.72

Taxes + Airline & Agency Fees \$103.99

---

Total: \$730.71

We have charged \$730.71 to your American Express&reg; Card xxxx-xxxx-xxxx-3008.

Taxes and fees link: [http://svc.travelocity.com/info/info\\_popup\\_sa/0,,TRAVELOCITY:EN|TAXS FEES,00.html](http://svc.travelocity.com/info/info_popup_sa/0,,TRAVELOCITY:EN|TAXS FEES,00.html)

> Travelocity fees and airline charges will be shown as separate line items on your credit card statements.

ANTHONY R INGRAFFEA \$720.72

\*\*\*\*\*  
TRAVEL CHECKLIST  
\*\*\*\*\*

> Printed itinerary - As you will not receive a paper ticket, we suggest you print this email to take along with you on your trip.

> Photo ID - Every passenger must have a valid government-issued photo ID (such as a driver's license or passport). Please note that the name on your photo ID must match the passenger name in your reservation.

> TSA Secure Flight Information - Any information you provided has been added to your reservation.

> Special Services/Meal Requests - Please confirm your special request or meal request with the airline.

> Terminal/gate information - Check with the airline  
<http://travelocity.custhelp.com/cgi-bin/travelocity.cfg/php/enduser>

# Travelocity.com Cancellation Confirmation

memberservices@travelocity.com

Sent: Monday, September 30, 2013 11:54 AM

To: Anthony R. Ingraffea

\*\*\*\*\*

Your airline reservation has been cancelled.

\*\*\*\*\*

- You will not receive a refund since you purchased a non-refundable ticket(s).
- You will need to have the ticket number(s) listed in the passenger information section below when you are ready to use any remaining ticket value toward a new reservation. Please call us at 888-872-8356 to book your next trip.
- Please save or print this email for your records, because cancelled reservations are not viewable online at this time.

We're sorry you had to cancel this reservation, but we look forward to helping you plan your next trip!

\*\*\*\*\*

Cancelled AIRLINE RESERVATION

\*\*\*\*\*

Trip ID: 132653438217

\*\*\*\*\*

Passenger Name: ANTHONY INGRAFFEA

Ticket Number (assigned by the airline to your e-ticket): 7308080433

\*\*\*\*\*

### Important Restrictions:

\*\*\*\*\*

- Remaining ticket value of a fully unused ticket can be used toward future travel to any destination served by the airline on your original ticket.
- Partially used tickets normally require you to keep the original origin and destination
- Future travel must be completed within a limited time period, Carriers either require you to rebook before your original departure date or may allow 1 year from the date tickets were originally issued. It depends on the fare rules from the original ticket.
- Remaining ticket value can only be used by the individual named on the original ticket.
- If the fare of the new itinerary is greater than the remaining value of the original ticket, the airline will collect the fare difference. In addition, the airline will charge a fee to use your original ticket towards the purchase of the new ticket. You will be advised of the exact charges when you make your new reservations.
- An administrative service charge will be collected at the time of reissuance

## CURRICULUM VITAE

### Anthony R. Ingraffea

Dwight C. Baum Professor of Engineering  
Weiss Presidential Teaching Fellow  
School of Civil and Environmental Engineering  
Cornell University  
Ithaca, N.Y. 14853 USA

#### GENERAL

Born: April 4, 1947, Easton, Pennsylvania, USA  
Residence: 309 Cayuga Heights Road, Ithaca, N.Y. 14850  
Telephone: Home 607-257-1104 Office 607-255-3336 Cell 607-351-0043  
Fax: 607-255-9004 E-Mail: aril@cornell.edu HTTP://www.cfg.cornell.edu

#### EDUCATION

University of Notre Dame  
B.S., Aerospace Engineering, *Magna Cum Laude*, June 1969.  
Polytechnic Institute of New York  
M.S., Civil Engineering, Grumman Masters Fellow, June 1971.  
University of Colorado/Boulder  
Ph.D., Civil Engineering, May 1977, University Fellow, 1974-1976.

#### AREAS OF EXPERTISE

Structural Engineering, Structural Mechanics, Computational and Experimental Fracture Mechanics,  
Microstructural Simulation of Fatigue and Fracture Mechanisms, Rock Mechanics, Numerical Methods,  
Engineering Education

#### PROFESSIONAL EXPERIENCE

June 1969 - June 1971

**Grumman Aerospace Corporation. Bethpage, L.I., N.Y.**

**Rotating traineeship** in the following areas: preliminary design on Navy F - 14; loads and dynamic studies, stress analysis, and final design on NASA Space Shuttle proposal. Two in - house technical publications.

July 1971 - June 1973

**Peace Corps. Bejuma, Venezuela**

**County Engineer.** Responsible for all technical services to a county of 40,000 people. Directed surveying, design, and construction of farmers' market, tourist hotel, and cemetery. Directed urban planning resource study. Co - directed urban renewal plan and data collection for section of state capital city.

September 1973 - August 1977

**University of Colorado/Boulder**

Department of Civil, Environmental and Architectural Engineering

**Instructor** for Courses:

Analytical Mechanics, Theoretical Fluid Mechanics

**Teaching Assistant** for Courses:

Mechanics of Materials

Materials Testing Laboratory

**Research Assistant** in Project: Constitutive Relations for Coal

September 1977 - June 1982

Cornell University, Department of Structural Engineering

**Assistant Professor**

September 1979 - July 1983

Cornell University, Department of Structural Engineering  
**Manager of Experimental Research**

July 1982 - June 1987

Cornell University, Department of Structural Engineering  
**Associate Professor**

August 1983 - August 1984

Lawrence Livermore National Laboratory Livermore, California  
**Visiting Research Engineer: Rock Fracture Simulation**

January 1986 - September, 1986

Cornell University, Computer Aided Design Instructional Facility,  
College of Engineering  
**Director**

September 1986 - October, 1990

Cornell University, College of Engineering  
**Faculty Coordinator for Instructional Computing**

July 1987 - Present

Cornell University, School of Civil and Environmental Engineering  
**Professor**

September 1987 - April 1992

Cornell University, Program of Computer Graphics  
**Associate Director**

September 1988 - Present

Fracture Analysis Consultants, Inc.  
**President**

October 1990 - October 1994

Cornell University  
**Director, NSF-Synthesis National Engineering Education Coalition**

July 1993 - Present

Cornell University  
**Dwight C. Baum Professor of Engineering**

October 1994 - October 1995

Cornell University  
**Associate Director, NSF-Synthesis National Engineering Education Coalition**

December 1997 – August 2005

Cornell Center for Theory and Simulation in Science and Engineering  
**Associate Director**  
**Coordinator, Computational Materials Institute**

July 1998 – December 1999

Cornell University  
**Coordinator, Infrastructure Group, School of Civil and Environmental Engineering**

November 2002-Present

Cornell University  
**Member, Graduate Fields of Mechanical and Aerospace Engineering**

May 2004-Present

Wright Patterson Air Force Base/AFRL/Air Vehicle Directorate/Structures Division  
Structural Sciences Center of Excellence  
**Visiting Scientist**

August 2005 – July 2007

Cornell University  
**Acting Director**, Cornell Center for Theory and Simulation in Science and Engineering

November 2005 – Present

Cornell University  
**Weiss Presidential Fellow**

July 2006 – December 2007

Cornell University  
**Coordinator**, Infrastructure Group, School of Civil and Environmental Engineering

August 2005 – Present

Cornell University  
**Co-Editor in Chief**, *Engineering Fracture Mechanics*

August 2010 – Present

Physicians, Scientists, and Engineers for Sustainable and Healthy Energy, Inc.  
**President**

#### AWARDS AND HONORS

- **3 - M Corporation Scholarship**, 1965 - 1969
- **Grumman Masters Fellowship**, 1969 - 1971
- University of Colorado **Graduate Fellowships**, 1974 - 1976
- Cornell School of Civil Engineering "**Professor of the Year**," 1977 - 78
- National Research Council/U.S. National Committee for Rock Mechanics **1978 Award for Outstanding Research in Rock Mechanics at the Doctoral Level**
- Cornell College of Engineering "**Professor of the Year**," 1978 - 79
- Cornell School of Civil Engineering "**Professor of the Year**," 1981 - 82
- **Presidential Young Investigator Award**, National Science Foundation, 1984 - 1989
- **Dean's Prize for Innovation in Teaching**, Cornell College of Engineering, 1989.
- **Dean's Prize for Innovation in Teaching**, Cornell College of Engineering, 1991.
- National Research Council/U. S. National Committee for Rock Mechanics **1991 Award for Applied Research** for the paper, "Simulation of Hydraulic Fracture Propagation in Poroelastic Rock with Application to Stress Measurement Techniques", co-authored by Dr. T. J. Boone, *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr.*, 28, 1, 1-14, 1991.
- International Association for Computer Methods and Advances in Geomechanics **1994 Significant Paper Award**: One of Five Significant Papers in the category of Computational/Analytical Applications in the past 20 years, "A Numerical Procedure for Simulation of Hydraulically-driven Fracture Propagation in Poroelastic Media", co-authored with T. J. Boone, *Int. J. Num. Analyt. Meth. in Geomech.*, 14, 1, 1990.
- The **NASA Group Achievement Award** for contributions, with former students Drs. Paul Wawrzynek and David Potyondy, to the Fuselage Structural Integrity Analysis Team, NASA Langley Research Center, 1996.
- The **First Society of Women Engineer's Professor of the Year Award**, Cornell College of Engineering, 1997.
- **J. P. and Mary Barger '50 Excellence in Teaching Award**, Cornell College of Engineering, 1997.
- The **MTS Visiting Professor Chair**, Department of Civil Engineering, University of Minnesota, May, 1998.
- **Aviation Safety Turning Goals into Reality Award**, NASA Airframe Structural Integrity Program Team, NASA Langley Research Center, with Dr. Paul Wawrzynek, 1999.
- **1999 Premier Award for Educational Software** for "Cracking Dams-[HTTP://www.simsience.org](http://www.simsience.org)", with Megann Polaha
- **Daniel Luzar '29 Excellence in Teaching Award**, Cornell College of Engineering, 2001.

- **Honor Award, University of Notre Dame**, College of Engineering, for “Significant Contributions to the Advancement of Engineering”, 2002.
- **Weiss Presidential Teaching Fellow**, Cornell University, 2005.
- **George R. Irwin Medal**, American Society for Testing and Materials, 2006.
- **Richard J. Almeida Award, Project High Jump**, given each year to an individual whose dedication and contribution to High Jump have been extraordinary, 2008.
- **Fellow, International Congress on Fracture**, 2009, “For his pioneering contributions to the advanced computational simulation of fatigue and fracture processes leading to improved understanding for practical applications to integrity assessment of engineering structures”.
- One of **TIME Magazine’s “People That Mattered”** in 2011.

#### **HONORARY/PROFESSIONAL SOCIETY MEMBERSHIP**

Tau Beta Pi (1967 -  
Chi Epsilon (1974 -  
Sigma Xi (1977 -  
American Academy of Mechanics (1988 -  
American Society of Civil Engineers (**Fellow, 1991**)  
Chairman, Committee on Properties of Materials (1983 - 1985)  
Member, Committee on Finite Element Analysis of Reinforced Concrete  
Member, Committee on Computer Applications and Numerical Methods  
International Society for Boundary Elements  
International Society for Rock Mechanics  
Society for Experimental Mechanics  
American Society for Testing and Materials  
Committee E - 8 on Fracture and Fatigue  
Committee D - 18 on Soil and Rock for Engineering Purposes  
Committee C - 9 on Concrete  
American Concrete Institute  
Committee 446 on Fracture Mechanics  
RILEM  
Committee 90 - FMA on Fracture Mechanics Applications  
Member, Committee 89 - FMT on Fracture Mechanics Testing  
American Rock Mechanics Association/Foundation  
Founding Member  
Member of the Board, 1999-2003

#### **PROFESSIONAL REGISTRATION**

Colorado PE No. 14837  
New York PE No. 081309-0  
Alaska Professional Fishing Guide

#### **UNITED STATES PATENT**

Number 481,826, Hand - held, direct reading, fully mechanical fracture loading device for short-rod/bar specimens

#### **PROFESSIONAL JOURNAL EDITORSHIPS AND ADVISORY BOARDS**

Co-Editor-in-Chief:  
*Engineering Fracture Mechanics*, August, 2005-present

Editorial Advisory Board:  
*International Journal for Numerical and Analytical Methods in Geomechanics*  
*Boundary Element Communications*  
*Engineering with Computers*  
*Engineering Computations*  
*International Journal for Multiscale Computational Engineering*

## PUBLICATIONS

### TEXTS EDITED

1. **Fracture Mechanics of Concrete: Material Characterization and Testing**, co - edited with A. Carpinteri, Martinus Nijhoff Publishers, 1984.

### PUBLISHED IN TEXTS

1. Ingrassia, A R (co - author). Modelling of Reinforcement and Representation of Bond. Chapter 3 in **Finite Element Analysis of Reinforced Concrete**, State - of - the - Art report prepared by the Task Committee on Finite Element Analysis of Reinforced Concrete Structures, Structural Division, ASCE, 1982, pp. 149 - 203.
2. Ingrassia A R (co - author). Concrete Cracking. Chapter 4 in **Finite Element Analysis of Reinforced Concrete**. State-of-the-Art report prepared by the Task Committee on Finite Element Analysis of Reinforced Concrete Structures, Structural Division, ASCE, 1982, pp. 204 - 233.
3. Ingrassia A R. Numerical Modelling of Fracture Propagation. Chapter 4 in **Rock Fracture Mechanics**, H. P. Rossmanith, editor, CISM Courses and lectures No. 275, International Center for Mechanical Sciences, Udine, Italy, Springer - Verlag, Wien - New York, 1983, pp. 151 - 208.
4. Ingrassia A R, Saouma V. Numerical Modeling of Discrete Crack Propagation in Reinforced and Plain Concrete. Chapter 4 in **Application of Fracture Mechanics to Concrete Structures: Structural Application and Numerical Calculation**, G. C. Sih and A. DiTommaso, editors, Martinus Nijhoff Publishers, 1984.
5. Ingrassia A R, Gerstle W. Non - Linear Fracture Models for Discrete Crack Propagation. **Application of Fracture Mechanics to Cementitious Composites**, S. P. Shah, editor, Martinus Nijhoff Publishers, 1985, pp. 171 - 209.
6. Ingrassia A R. Fracture Propagation in Rock. Chapter 12 in **Mechanics of Geomaterials**, Z. P. Bazant, editor, John Wiley & Sons, Limited, 1985.
7. Ingrassia A R. Theory of Crack Initiation and Propagation in Rock. Chapter 3 in **Rock Fracture Mechanics**, B. Atkinson, editor, Academic Press, Inc., 1987.
8. Ingrassia A R, Gerstle W H, Perucchio R. Fracture Analysis with Interactive Computer Graphics. **Boundary Element Methods in Structural Analysis**, D. E. Beskos, Editor, ASCE, 1989, pp. 235 - 271.
9. Ingrassia A R, Sections 9.3, 12.3, 13.4, and 15.2, of **Fracture Mechanics of Concrete Structures: From Theory to Applications**, L. Elfgren, Editor, Chapman and Hall, London, 1989.
10. Ingrassia A R, Boone T J, Swenson D V. Computer Simulation of Fracture Processes. Chapter 22 in **Comprehensive Rock Engineering**, J. Hudson, Editor-in-Chief, Pergamon Press, Oxford, 1993.
11. Carter B J, Desroches J, Ingrassia A R, Wawrzynek P A. Simulating Fully 3D Hydraulic Fracturing. In **Modeling in Geomechanics**, Ed. Zaman, Booker, and Gioda, Wiley Publishers, pp 525-557, 2000.
12. Ingrassia A R, Wawrzynek P A. Crack Propagation. In the **Encyclopedia of Materials: Science and Technology**, Elsevier Science, 2001.
13. Ingrassia A R, Wawrzynek P A. Finite Element Methods for Linear Elastic Fracture Mechanics. Chapter 3.1 in **Comprehensive Structural Integrity**, R. de Borst and H. Mang (eds), Elsevier Science Ltd., Oxford, England, 2003.
14. Ingrassia A R. Computational Fracture Mechanics. Volume 2, Chapter 11, **Encyclopedia of Computational Mechanics**, E. Stein, R. de Borst, T. Hughes (eds.) John Wiley and Sons, 2004, 2<sup>nd</sup> Edition 2008.

15. Emery J, Ingraffea A R. DDSim: Framework for Multiscale Structural Prognosis, Chapter 13 in **Computational Methods for Microstructure-Property Relationships**, S Ghosh and D Dimiduk (eds), Springer Science, 2011.

## PUBLISHED IN JOURNALS

1. Ingraffea AR. Nodal Grafting for Crack Propagation Studies. *Int. J. Num. Meth. Eng.*, **11**, 7, 1977, 1185 - 1187.
2. Lynn PP, Ingraffea AR. Transition Element to be Used With Quarter - Point Crack Tip Elements. *Int. J. Num. Meth. Eng.*, **12**, 6, 1978, 1031 - 1036.
3. Ingraffea AR, Heuze FE. Finite Element Models for Rock Fracture Mechanics. *Int. J. Num. Analyt. Meth. Geomech.*, **4**, 1980, 25 - 43.
4. Ingraffea AR, Manu C. Stress - Intensity Factor Computation in Three Dimensions With Quarter - Point Elements. *Int. J. Num. Meth. Eng.*, **15**, 10, 1980, 1427 - 1445.
5. Blandford G, Ingraffea AR, Liggett JA. Two-Dimensional Stress Intensity Factor Calculations Using the Boundary Element Method. *Int. J. Num. Meth. Eng.*, **17**, 1981, 387 - 404.
6. Beech J, Ingraffea, AR. Three - Dimensional Finite Element Stress Intensity Factor Calibration of the Short Rod Specimen. *Int. J. Fracture*, **18**, 3, 1982, 217 - 229.
7. Perucchio R, Ingraffea AR, Abel JF. Interactive Computer Graphic Preprocessing for Three - Dimensional Finite Element Analysis. *Int. J. Num. Meth. Eng.*, **18**, 6, 1982, 909 - 926.
8. Saouma V, Ingraffea AR, Catalano D. Fracture Toughness of Concrete:  $K_{Ic}$  Revisited. *J. Eng. Mech. Div.*, ASCE, **108**, No. EM6, 1982, 1152 - 1166.
9. Perucchio R, Ingraffea AR. Interactive Computer Graphics Preprocessing for Three - Dimensional Boundary Integral Element Analysis. *J. Computers Structures*, **16**, 1 - 4, 1983, 153 - 166.
10. Ingraffea AR, Blandford G, Liggett JA. Automatic Modelling of Mixed - Mode Fatigue and Quasi - Static Crack Propagation Using the Boundary Element Method. *ASTM STP 791: Proc. of the 14th National Symposium on Fracture Mechanics*, June, 1983, I - 407 - I - 426.
11. Ingraffea AR, Gunsallus KL, Beech JF, Nelson PP. A Short - Rod Based System for Fracture Toughness Testing of Rock. *ASTM STP 855: Chevron - Notched Specimens: Testing and Stress Analysis*, 1984, 152 - 166.
12. Ingraffea AR, Perucchio R, Han T - Y, Gerstle WH, Huang YP. Three - Dimensional Finite and Boundary Element Calibration of the Short - Rod Specimen. *ASTM STP 855: Chevron-Notched Specimens: Testing and Stress Analysis*, 1984, 49 - 68.
13. Manu C, Ingraffea AR. Numerical Evaluation of the Growth Rate Material Parameters in Fatigue Propagation of Surface Flaws. *Nucl. Eng. Design*, **77**, 2, March, 1984, 131 - 138.
14. Ingraffea AR, Gerstle W, Gergely P, Saouma V. Fracture Mechanics of Bond in Reinforced Concrete. *J. Structural Division*, ASCE, **110**, 4, 1984, 871 - 890.
15. Perucchio R, Ingraffea AR. An Integrated Boundary Element Analysis System with Interactive Computer Graphics for Three Dimensional Linear - Elastic Fracture Mechanics. *J. Comp. Structures*, **20**, 1985, 157 - 171.
16. Nelson PP, Ingraffea AR, O'Rourke TD. TBM Performance Prediction with Rock Fracture Parameters. *Int. J. Rock Mech. Mining Sciences*, **22**, 3, June, 1985, 189 - 192.

17. Elices M, Llorca J, Ingraffea AR. Fractura del Hormigon en Regimen Elastico y Lineal. Un Ejemplo: La Presa de Fontana (in Spanish), *Informes de la Construcion*. **37**, 372, July, 1985, 19 - 33.
18. Ingraffea AR, Gerstle WH, Mettam K, Wawrzynek P, Hellier AK. Cracking of Welded Crane Runway Girders: Physical Testing and Computer Simulation. *Iron and Steel Engineer*, **62**, 12, 1985, 46 - 52.
19. Boone TJ, Wawrzynek P, Ingraffea AR. Simulation of the Fracture Process in Rock with Application to Hydrofracturing. *Int. J. Rock Mech. Mining Sciences*, **23**, 3, 1986, 255 - 265.
20. Abel JF, Ingraffea AR, McGuire W, Greenberg DP. Interactive Color Graphical Postprocessing as a Unifying Influence in Numerical Analysis Research. *Finite Elements in Analysis and Design*, **2**, 1986, 1 - 17.
21. Boone TJ, Wawrzynek P, Ingraffea AR. Finite Element Modeling of Fracture Propagation in Orthotropic Materials. *Eng. Fract. Mech.*, **26**, 2, 1987, 185 - 201.
22. Gerstle WH, Martha L, Ingraffea AR. Finite and Boundary Element Modeling of Crack Propagation in Two - and Three - Dimensions. *Eng. with Computers*. **2**, 1987, 167 - 183.
23. Hellier AK, Sansalone M, Ingraffea AR, Carino NJ, Stone, C. Finite Element Analysis of the Pullout Test Using a Nonlinear Discrete Cracking Approach. *Cement, Concrete and Aggregates*, **9**, 1, Summer 1987, 20 - 29.
24. Wawrzynek P, Ingraffea AR. Interactive Finite Element Analysis of Fracture Processes: An Integrated Approach. *Theor. Appld. Fract. Mech.* **8**, 1987, 137 - 150.
25. Wawrzynek P, Ingraffea AR. An Edge - Based Data Structure for Two-Dimensional Finite Element Analysis. *Eng. with Computers*, **3**, 1987, 13 - 20.
26. Llorca J, Elices M, Ingraffea AR. Analisis Lineal Y No Lineal De Propagacion De Fisuras En Hormigon," (In Spanish), *Revista Internacional de Metodos Numericos para Calculo y Diseno en Ingenieria*, **3**, 3, 1987, 309 - 333.
27. Swenson DV, Ingraffea AR. Using Combined Experiments and Analysis to Generate Dynamic Critical Stress Intensity Data. *ASTM STP 969: Fracture Mechanics: 19th Symposium*, T. A. Cruse, Ed., American Society for Testing and Materials, Phila., 1988, 405 - 426.
28. Gerstle WH, Ingraffea AR, Perucchio R. Three-Dimensional Fatigue Crack Propagation Analysis Using the Boundary Element Method. *Int.J. Fatigue*, **10**, 3, 1988, 187 - 192.
29. Swenson DV, Ingraffea AR. Modelling Mixed-Mode Dynamic Crack Propagation Using Finite Elements: Theory and Applications. *Computational Mech.*, **3**, 1988, 187-192.
30. Linsbauer HN, Ingraffea AR, Rossmanith H P, Wawrzynek PA. Simulation of Cracking in a Large Arch Dam: Part I. *J. Structural Eng.*, **115**, 7, July 1989, 1599 - 1615.
31. Linsbauer HN, Ingraffea AR, Rossmanith HP, Wawrzynek PA. Simulation of Cracking in a Large Arch Dam: Part II. *J. Structural Eng.*, **115**, 7, July, 1989, 1616 - 1630.
32. Ingraffea AR. Case Studies of Simulation of Fracture in Concrete Dams. *Eng. Fracture Mech.*, **35**, 1/2/3, 1990, 553-564.
33. Vossoughi H, Soudki K, White RN, Ingraffea AR, Sansalone M. Fatigue of Thick Steel Plates Bent to a Low R/t Ratio. *J. Pressure Vessel Tech.*, **111**, August 1989, 259 - 265.
34. Boone TJ, Ingraffea AR. A Numerical Procedure for Simulation of Hydraulically - Driven Fracture Propagation in Poroelastic Media. *Int. J. Num. Analyt. Meth. Geomech.*, **14**, 1990, 27-47.
35. Grigoriu M, Saif M, El Borgi S, Ingraffea AR. Mixed - Mode Fracture Initiation and Trajectory Prediction Under Random Stresses. *Int. J. Fracture*, **45**, 1990, 19-34.

36. Boone TJ, Ingraffea AR, Roegiers J - C. Visualization of Hydraulically - Driven Fracture Propagation in Poroelastic Media Using a Super - Workstation. *J. Petroleum Tech*, June 1989, 574 - 580.
37. Wawrzynek PA, Ingraffea AR. An Interactive Approach to Local Remeshing Around a Propagating Crack. *Finite Elem. in Analys. and Design*, 5, 1989, 87 - 96.
38. Ingraffea AR, Barry A. Analytical Study of Transmission, Distribution Lines under Railroads. *Pipe Line Industry*, October 1989, 34 - 39.
39. Gray LJ, Martha LF, Ingraffea AR. Hypersingular Integrals in Boundary Element Fracture Analysis. *Int. J. Num. Meth. Eng.*, 29, 1990, 1135-1158.
40. Mann KA, Bartel DL, Wright TM, Ingraffea AR. Mechanical Characteristics of the Stem-Cement Interface. *J. Ortho. Research*, 9, 798-808, 1991.
41. Heuze F, Shaffer RJ, Ingraffea AR, Nilson RH. Propagation of Fluid-driven fractures in Jointed Rock. Part 1 - Development and Validation of Methods of Analysis. *Int. J. Rock Mech. Mining Sci. & Geomech. Abstr.*, 27, 4, 243 - 254, 1990.
42. Swenson DV, Ingraffea AR. The Collapse of the Schoharie Creek Bridge: A Case Study in Concrete Fracture Mechanics. *Int. J. Fracture*, 51, 73-92, 1991.
43. Gerstle WH, Ingraffea AR. Does Bond-Slip Exist? *Concrete International*, 13, 1, 44-48, 1991.
44. Gerstle WH, Ingraffea AR. Compliance and Stress-Intensity Factor Calibration of the CENRBB Specimen. *Int. J. Rock Mech. Mining Sci. & Geomech. Abstr.*, 28, 1, 85-92, 1991.
45. Bittencourt TN, Barry A, Ingraffea AR. Comparison of Mixed-Mode Stress Intensity Factors Obtained Through Displacement Correlation, J-Integral Formulation, and Modified Crack-Closure Integral. *ASTM STP 1131: Fracture Mechanics: Twenty Second Symposium (Vol. II)*, Philadelphia, 69-82, 1992.
46. Boone TJ, Ingraffea AR, Roegiers JC. Simulation of Hydraulic Fracture Propagation in Poroelastic Rock with Application to Stress Measurement Techniques. *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr.*, 28, 1, 1-14, 1991.
47. Mukherjee Y X, Xie Z, Ingraffea AR. Delamination Buckling of Laminated Plates. *Int. J. Num. Meth. Eng.*, 32, 1321-1337, 1991.
48. Martha LF, Llorca J, Ingraffea AR, Elices M. Numerical Simulation of Crack Initiation and Propagation in an Arch Dam. *Dam Engineering*, 2, 3, 193-214, 1991.
49. Martha LF, Gray, L J, Ingraffea AR. Three-Dimensional Fracture Simulation with a Single-Domain, Direct Boundary Element Formulation. *Int. J. Num. Meth. Eng.*, 35, 1992.
50. Gaisbauer H, Rossmann H-P, Ingraffea AR. Der Einfluß von Talform und Schwächezonen im wasserstetigen Aufstandsbereich auf das Tragverhalten einer Gewölbesperre. (In German) *Osterreichische Ingenieur- und Architekten-Zeitschrift*, 137, 9, 427-434, 1992.
51. Lutz E, Ingraffea AR, Gray L. Use of 'Simple Solutions' for Boundary Integral Methods in Elasticity and Fracture Analysis. *Int. J. Num. Meth. Eng.*, 35, 1737-1751, 1992.
52. Soudki KA, Sansalone M, Ingraffea AR, Vossoughi H. Numerical Simulation of the Severe Cold Bending of Thick Steel Plates. *ASME, J. Pressure Vessel Tech.*, 114, 1992.
53. Martha L, Wawrzynek P, Ingraffea AR. Arbitrary Crack Propagation Using Solid Modeling. *Engrg. with Computers*, 9, 2, 63-82, 1993.

54. Sousa J, Carter B, Ingraffea AR. Numerical Simulation of 3D Hydraulic Fracture Using Newtonian and Power-Law Fluids. *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr.*, **30**, 7, 1265-1271, 1993.
55. Elbert K, Wright T, Rimnac C, Klein R, Ingraffea AR, Gunsallus K, Bartel D. Fatigue Crack Propagation Behavior of Ultra High Molecular Weight Polyethelene under Mixed Mode Conditions", *J. Biomedical Materials Research*, **28**, 181-187, 1994.
56. Gray L, Potyondy D, Lutz E, Wawrzynek P, Martha L, Ingraffea AR. Crack Propagation Modeling. *Math. Models Meth. Applied Sci.*, **4**, 2, 179-202, 1994.
57. Potyondy D, Wawrzynek P, Ingraffea AR. Discrete Crack Growth Analysis Methodology for Through Cracks in Pressurized Fuselage Structures. *Int. J. Num. Methods Eng.*, **38**, 1611-1633, 1995.
58. Potyondy D, Wawrzynek P, Ingraffea AR. An Algorithm to Generate Quadrilateral or Triangular Element Surface Meshes in Arbitrary Domains with Applications to Crack Propagation. *Int. J. Num. Methods Eng.*, **38**, 2677-2701, 1995.
59. Bittencourt T, Wawrzynek P, Sousa J, Ingraffea, AR. Quasi-Automatic Simulation of Crack Propagation for 2D LEFM Problems. *Eng. Fract. Mech.*, **55**, 2, 321-334, 1996.
60. Bittencourt T, Ingraffea AR. Three-Dimensional Cohesive Crack Analysis of Short-Rod Specimens. *ASTM-STP 1220: Fracture Mechanics: 25th Volume*, 46-60, 1995.
61. Bittencourt T, Ingraffea AR. Um Metodo Numericao para o Modelmento de Fraturamento Coesivo em 3D (In Portugese). *Revista Internacional de Metodos Numericos para Calculo y Diseno en Ingenieria*, **11**, 4, 1-10, 1995.
62. Zehnder A, Ingraffea AR. Reinforcing Effects of Coverlayers on the Fatigue Life of Copper-Kapton Flex Cables. *IEEE Trans. Comp. Pack. Manuf. Tech.*, **18**:704-710, 1995.
63. Shah KR, Carter BJ, Ingraffea AR. Hydraulic Fracturing Simulation in Parallel Computing Environment. *Int. J. Rock Mech. & Min. Sci.*, **34**, 3-4, Paper 282, 1997.
64. Chen C-S, Wawrzynek PA, Ingraffea AR. Methodology for Fatigue Crack Growth and Residual Strength Prediction with Applications to Aircraft Fuselages. *Computational Mechanics*, **19**:527-532, 1997.
65. Hanson JH, Ingraffea AR. Standards for Fracture Toughness Testing of Rock and Manufactured Ceramics: What Can We Learn for Concrete? *Cement, Concrete and Aggregates*, **19**:79-87, 1997.
66. Riddell WT, Ingraffea AR, Warwzynek PA. Experimental Observations and Numerical Predictions of Three-Dimensional Fatigue Crack Propagation. *Eng. Fract. Mech.*, **58**: 293-310, 1997.
67. Singh R, Carter B, Wawrzynek P, Ingraffea AR. Universal Crack Closure Integral for SIF Estimation. *Eng. Fract. Mech.*, **60**:133-146, 1998.
68. Hwang CG, Wawrzynek P, Tayebi AK, Ingraffea AR. On the Virtual Crack Extension Method for Calculation of the Rates of Energy Release Rate. *Eng. Fract. Mech.*, **59**:521-542, 1998.
69. Chen C-S, Wawrzynek, PA, Ingraffea AR. Elastic-Plastic Crack Growth Simulation and Residual Strength Prediction of Thin Plates with Single and Multiple Cracks. *Fatigue and Fracture Mechanics: 29th Volume, ASTMSTP 1332*, 97-113, 1998.
70. Carter BJ, Wawrzynek, PA, Ingraffea AR. Automated 3D Crack Growth Simulation. Gallagher Special Issue of *Int. J. Num. Methods Eng.*, **47**:229-253, 2000.
71. Chi W-M, Deierlein G, Ingraffea AR. Finite Element Fracture Analysis of Welded Beam-Column Connections. *Fatigue and Fracture Mechanics: 30th Volume, ASTM STP 1360*, 439-455, 2000.

72. Castell M, Ingrassia AR, Irwin L. Fatigue Crack Growth in Pavements. **126**:283-290, *ASCE J. Transportation Eng.*, 2000.
73. TerMaath SC, Ingrassia AR, Wawrzynek PA. A Computational Fracture Mechanics Approach for the Analysis of Facesheet-from-Core Disbond of Honeycomb Core Sandwich Panels. *Fatigue and Fracture Mechanics: 30th Volume, STP 1360*, P.C. Paris and K.L. Jerina, Eds., American Society for Testing and Materials, West Conshohocken, PA, 169-182, 1999.
74. Chen C-S, Krause R, Pettit RG, Banks-Sills L, Ingrassia A R. Numerical Assessment of T-stress Computation Using a P-version Finite Element Method. *Int. J. Fract.*, **107**:177-199, 2001.
75. Chi W-M, Deierlein GG, Ingrassia AR. Fracture Toughness Demands in Welded Beam-Column Moment Connections. *J. Structural Division*, ASCE, **126**:88-97, 2000.
76. B. Carter, C. S. Chen, L. P. Chew, Nikos Chrisochoides, G. R. Gao, G. Heber, A. R. Ingrassia, R. Krause, C. Myers, D. Nave, K. Pingali, P. Stodghill, S. Vavasis, and P. A. Wawrzynek Parallel FEM Simulation of Crack Propagation -- Challenges, Status, and Perspectives. *Lect. Notes Comput. Sci.*, **1800**:443-449, 2000.
77. Spievak L, Lewicki D, Wawrzynek P, Ingrassia AR. Simulating Fatigue Crack Growth in Spiral Bevel Gears. *Eng. Fract. Mech.*, **68**:53-76, 2001.
78. Pettit R, Chen, C-S, Wawrzynek P, Ingrassia AR. Process Zone Size Effects on Naturally Curving Cracks. *Eng. Fract. Mech.*, **68**:1181-1205, 2001.
79. Chen C-S, Wawrzynek PA, Ingrassia AR. Residual Strength Prediction of Airplane Fuselages Using CTOA Criterion. *AIAA Journal*, **40**:566-575, 2002.
80. Chen C-S, Wawrzynek PA, Ingrassia AR. Prediction of Residual Strength and Curvilinear Crack Growth in Aircraft Fuselages," *AIAA Journal*, **40**:1644-1652, 2002.
81. Hwang CG, Wawrzynek, PA, Ingrassia AR. On the virtual crack extension method for calculating the derivatives of energy release rates for a 3D planar crack of arbitrary shape under mode-I loading. *Eng. Fract. Mech.*, **68**:925-947, 2001.
82. Lewicki D, Spievak L, Wawrzynek P, Ingrassia AR, Handschuh R. Consideration of Moving Tooth Load in Gear Crack Propagation Predictions. *J. Mechanical Design*, **123**:118-124, 2001.
83. Cavalcante-Neto JBC, Wawrzynek PA, Carvalho MTM, Ingrassia AR. An algorithm for three-dimensional mesh generation for arbitrary regions with cracks. *Eng. With Computers*, **17**:75-91, 2001.
84. Hanson JH, Ingrassia, AR. Compression Loading Applied to Round Double Beam Fracture Specimens. I: Application to Materials with Large Characteristic Lengths. *J. Testing and Evaluation*, **30**:508-514, 2002.
85. Hanson JH, Ingrassia AR. Compression Loading Applied to Round Double Beam Fracture Specimens. II: Derivation of Geometry Factor. *J. Testing and Evaluation*, **30**:515-523, 2002.
86. Hanson JH, Ingrassia AR. Using Numerical Simulations to Determine the Accuracy of the Size-Effect and Two-Parameter Data Reduction Methods for Fracture Toughness Tests of Concrete. *Eng. Fract. Mech.*, **70**:1015-1027, 2002.
87. Han T-S, Ural A, Chen C-S, Zehnder AT, Ingrassia AR, Billington SL. Delamination buckling and propagation analysis of honeycomb panels using a cohesive element approach. *Int. J. Fract.*, **115**:101-123, 2002.

88. Iesulauro E, Ingraffea AR, Arwade S, Wawrzynek PA. Simulation of Grain Boundary Decohesion and Crack Initiation in Aluminum Microstructure Models. Fatigue and Fracture Mechanics: 33rd Volume, In *ASTM STP 1417*, W.G. Reuter and R.S. Piascik, Eds., American Society for Testing and Materials, West Conshohocken, PA, 715-728, 2002.
89. Ural A, Zehnder A, Ingraffea AR. Fracture mechanics approach to facesheet delamination in honeycomb: measurement of energy release rate of the adhesive bond. *Eng. Fract. Mech.*, **70**:93-103, 2002.
90. Riddell WT, Ingraffea AR, Wawrzynek PA. Propagation of non-planar fatigue cracks: experimental observations and numerical simulations. In *33rd National Symposium on Fatigue and Fracture Mechanics*; Moran, WY; USA; 25-29 June 2001. pp. 573-597. 2002
91. Chew P, Chrisochoides N, Gopalsamy S, Heber G, Ingraffea AR, Luke E, Neto J, Pingali K, Shih A, Soni B, Stodghill P, Thompson D, Vavasis S, Wawrzynek P. Computational science simulations based on web services. *Lect. Notes Comput. Sci.*, **2660**:299-308 2003.
92. Hwang CG, Ingraffea AR. Shape prediction and stability analysis of Mode-I planar cracks. *Eng. Fract. Mech.*, **71**:1751-1777, 2004.
93. Hanson JH, Bittencourt TN, Ingraffea AR. Three-dimensional influence coefficient method for cohesive crack simulations. *Eng. Fract. Mech.*, **71**:2109-2124, 2004.
94. Ural A, Heber G, Wawrzynek PA, Ingraffea AR, Lewicki DG, Cavalcante-Neto JB. Three-dimensional, Parallel, Finite Element Simulation of Fatigue Crack Growth in a Spiral Bevel Pinion Gear. *Eng. Fract. Mech.*, **72**:1148-1170, 2005.
95. Hwang CG, Wawrzynek PA, Ingraffea AR. On the calculation of derivatives of stress intensity factors for multiple cracks, *Eng. Fract. Mech.*, **72**, 1171-1196, 2005.
96. Banks-Sills L, Hershkovitz I, Wawrzynek PA, Eliasi R, Ingraffea AR. Methods for Calculating Stress Intensity Factors in Anisotropic Materials: Part I -  $z = 0$  is a Symmetric Plane, *Eng. Fract. Mech.*, **72**:2328-2358, 2005.
97. Cavalcante-Neto JB.; Martha LF, Wawrzynek PA, Ingraffea AR. A Back-tracking procedure for Optimization of simplex meshes, *Comm. Numer. Methods Eng.*, **21**:711-722, 2005.
98. Banks-Sills L, Hershkovitz I, Wawrzynek PA, Eliasi R, Ingraffea AR. Methods for calculating stress intensity factors in anisotropic materials: Part II—Arbitrary geometry, *Eng. Fract. Mech.*, **74**:1293-1307, 2007.
99. Hwang CG, Ingraffea AR. Virtual crack extension method for calculating the second order derivatives of energy release rates for multiply cracked systems. *Eng. Fract. Mech.*, **74**:1468-1487, 2007.
100. Miranda A, Martha L, Wawrzynek PA, Ingraffea AR. Surface mesh regeneration considering curvatures, *Eng Comp*, **25**:207-219, 2, 2009.
101. Coffman V, Sethna J, Heber G, Liu A, Ingraffea AR, Bailey N, Barker E. A Comparison of Finite Element and Atomistic Modeling of Fracture. *Modelling Simul. Mater. Sci. Eng.* **16**, 6, 2008, Article 065008.
102. Emery J, Hochhalter J, Wawrzynek P, Ingraffea AR. DDSim: A hierarchical, probabilistic, multiscale damage and durability simulation methodology – Part I: methodology and Level I. *Eng. Fract. Mech.*, **76**:1500-1530, 2009.
103. Bozek JE, Hochhalter JD, Veilleux MG, Liu M, Heber G, Sintay SD, Rollett AD, Littlewood DJ, Maniatty AM, Weiland H, Christ Jr. RJ, Payne J, Welsh G, Harlow DG, Wawrzynek PA, Ingraffea AR. A Geometric Approach to Modeling Microstructurally Small Fatigue Crack Formation- Part I: Probabilistic Simulation of Constituent Particle Cracking in AA 7075-T651. *Modelling Simul. Mater. Sci. Eng.* **16**, 6, 1 September 2008, Article 065007.

104. Hochhalter J, Littlewood D, Veilleux M, Bozek J, Ingraffea AR, Maniatty A. A geometric approach to modeling microstructurally small fatigue crack formation: II. Simulation and prediction of crack nucleation in AA 7075-T651. *Modelling Simul. Mater. Sci. Eng.* **18**, 2010, Article 045004
105. Coffman V, Sethna J, Ingraffea AR, Bailey N, Iesulauro E, Bozek J. Challenges in Continuum Modeling of Intergranular Fracture. *Strain*, doi: 10.1111/j.1475-1305.2010.00741.x., 2010.
106. Hochhalter JD, Littlewood DJ, Veilleux MG, Bozek JE, Maniatty AM, Rollett AD, Ingraffea AR. A Geometric Approach to Modeling Microstructurally Small Fatigue Crack Formation: III. Development of a semi-empirical model for nucleation. *Modelling Simul. Mater. Sci. Eng.*, **19** 035008 doi: 10.1088/0965-0393/19/3/035008, 2011.
107. Spear A, Priest A, Hochhalter J, Veilleux M, Ingraffea AR. Surrogate Modeling of High-fidelity Fracture Simulations for Real-time Residual Strength Predictions. *AIAA Journal*, **49**, 12, 2770-2782, doi: 10.2514/1.55295, 2011.
108. Howarth RW, Santoro R, Ingraffea AR. 2011. Methane and the greenhouse gas footprint of natural gas from shale formations. *Climatic Change Letters*, doi: 10.1007/s10584-011-0061-5, 2011.
109. Tuegel E, Ingraffea A, Eason T, Spottswood S. Re-engineering Aircraft Structural Life Prediction Using a Digital Twin. *Int J Aerospace Engrg.*, doi:10.1155/2011/154798, 2011.
110. Howarth R, Ingraffea AR. Should Fracking Stop? Yes, It's Too High Risk. *Nature*, **477**, 271-273, 2011.
111. Howarth, R, Santoro, R, Ingraffea AR. Venting and Leaking of Methane from Shale Gas Development: Response to Cathles *et al.*, *Climatic Change*, doi: 10.1007/s10584-012-0401-0, 2012.
112. Spear A, Ingraffea AR, Effect of chemical milling on low-cycle fatigue behavior of an Al-Mg-Si alloy, *Corrosion Science*, <http://dx.doi.org/10.1016/j.corsci.2012.11.006>.
113. Carter BJ, Schenck EC, Wawrzynek PA, Ingraffea AR, Barlow KW. Three-dimensional Simulation of Fretting Crack Nucleation and Growth. *Engrg. Fract. Mech.*, doi:10.1016/j.engfracmech.2012.08.015.
114. Brune P, Ingraffea AR, Jackson MD, Perucchio R. The fracture toughness of an Imperial Roman mortar. *Engrg. Fract. Mech.*, **102** (2013) 65–76.
115. Brock GR, Kim G, Ingraffea AR, Andrews JC, Pianetta P, van der Meulen M. Method for Nanoscale Examination of Microdamage in Bone Using Synchrotron Radiation Transmission X-Ray Microscopy. *PLoS ONE* **8**(3): e57942. doi:10.1371/journal.pone.0057942.
116. Jacobson MZ, Howarth R, Delucchi M, Scobie S, Barth J, Dvorak M, Klevze M, Katkhuda H, Miranda B, Chowdhury N, Jones R, Plano L, Ingraffea AR. Examining the feasibility of converting New York State's all-purpose energy infrastructure to one using wind, water, and sunlight. *Energy Policy* (2013), <http://dx.doi.org/10.1016/j.enpol.2013.02.036i>
117. Salvadori A, P. A. Wawrzynek P, Ingraffea AR. Energy dissipation in the mixed mode growth of cracks at the interface between brittle materials. *Int. J. Fracture* (2013), **181**, DOI 10.1007/s10704-013-9845-0.
118. Freitas M, Wawrzynek PA, Cavalcante-Neto JB, Vidal CA, Martha LF, Ingraffea AR. A distributed-memory parallel technique for two-dimensional mesh generation for arbitrary domains, *Advances in Engineering Software*, **59**, 2013, ISSN 0965-9978, 10.1016/j.advengsoft.2013.03.005.
119. Caulton D, Shepson P, Santoro R, Howarth R, Ingraffea AR, Sparks J, Cambaliza M, Sweeney C, Davis K, Lauvaux T, Stirn B, Belmecheri S, Sarmiento D. Quantifying Methane Emissions from an Area of Shale Gas Development in Pennsylvania. Submitted to *Science*, April, 2013.

120. Cerrone A, Wawrzynek P, Nonn A, Paulino G, Ingraffea AR. Implementation and verification of the PPR cohesive zone model in 3D. Submitted to *Engrg. Fract. Mech.*, April, 2013.
121. Veilleux MG, Hochhalter JD, Bozek JE, Ingraffea AR. A geometric approach to modeling microstructurally small fatigue crack formation: V. Observation and simulation of propagation dependence on microstructural heterogeneity. Submitted to *Modelling Simul. Mater. Sci. Eng.*, April, 2013.
122. Hochhalter JD, Veilleux MG, Bozek JE, LeDonne JE, Littlewood DJ, Maniatty AM, Rollett AD, Ingraffea AR. A Geometric Approach to Modeling Microstructurally Small Fatigue Crack Formation: IV. Mechanistic and probabilistic determination of hotspots. in preparation, May, 2013.
123. Veilleux MG, Hochhalter JD, Bozek JE, Ingraffea AR. A geometric approach to modeling microstructurally small fatigue crack formation: IV. Simulation of material heterogeneity and crack size influence on propagation mechanisms. in preparation, May, 2013.
124. Veilleux MG, Sintay SD, Zhang Y, Ma J, Hochhalter JD, Bozek JE, Rollett AD, Wawrzynek PA, Ingraffea AR. Geometrically explicit, three-dimensional finite element modeling of statistically realistic microstructures with fatigue cracks. in preparation, May, 2013.
125. Spear AD, Li SF, Lind J, Suter RM, Ingraffea AR. Characterization of Fatigue-Crack Nucleation and Microstructurally Small Propagation in an Aluminum Alloy Using Ex-Situ X-Ray Tomography and High-Energy X-Ray Diffraction Microscopy, in preparation, May, 2013.
126. Spear AD, Li, SF, Cerrone, AR, Ingraffea AR. Three-Dimensional Numerical Replication and Simulation of Microstructurally Small Fatigue Crack Evolution in an Aluminum Alloy. in preparation, May, 2013.

## **PUBLISHED IN REVIEWED PROCEEDINGS**

1. Ingraffea, A. R., Gerstle, K. H., Ko, H. - Y., "Effect of Orthotropy on Stress Concentrations," in **Mechanics in Engineering: Selected Proceedings of ASCE - EMD First Specialty Conference**, SM Study No. 11, University of Waterloo, 1976, 169 - 182.
2. Ingraffea, A. R., Gerstle, K. H., Ko, H. - Y., "Effect of Anisotropy on Stress Concentrations," **Proc. of the International Symposium on Numerical Methods in Soil and Rock Mechanics**, Karlsruhe, 1976, 91 - 99.
3. Ingraffea, A. R., Heuze, F., Ko, H. - Y., "Fracture Propagation in Rock: Laboratory Tests and Finite Element Analysis," **Proc. 17th U.S. Symposium on Rock Mechanics**, Snowbird, Utah, 1976, 5C4 - 1, 5C4 - 6.
4. Ingraffea, A. R., Heuze, F., Gerstle, K. H., "An Analysis of Discrete Fracture Propagation in Rock Loaded in Compression," **Proc. 18th U.S. Symposium on Rock Mechanics**, Keystone, Colorado, 1977, 2A4-1, 2A4-7.
5. Ingraffea, A. R., "On Discrete Fracture Propagation in Rock Loaded in Compression," **Proc. of the First International Conference on Numerical Methods in Fracture Mechanics**, A. R. Luxmoore and D.R.J. Owen, eds., Swansea, 1978, 235 - 248.
6. Ingraffea, A. R., Schmidt, R. A., "Experimental Verification of a Fracture Mechanics Model for Tensile Strength Prediction of Indiana Limestone," **Proc. 19th U.S. Symposium on Rock Mechanics**, Stateline, Nevada, 1978, 247 - 253.
7. Kulhawy, F. H., Ingraffea, A. R., "Geomechanical Model for Settlement of Long Dams on Discontinuous Rock Masses," **Proc. of International Symposium on Rock Mechanics Related to Dam Foundations**, International Society for Rock Mechanics, Vol. 1, Rio de Janeiro, September, 1978, III.115 - III.128.
8. Ingraffea, A. R., "The Strength - Ratio Effect in the Fracture of Rock Structures," **Proc. 20th U.S. Symposium on Rock Mechanics**, Austin, Texas, 1979, 153 - 169.

9. Blandford, G., Ingrassia, A. R., Liggett, J., "Mixed - Mode Stress Intensity Factor Calculations Using the Boundary Element Method," **Proc. Third Engineering Mechanics Division Specialty Conference, ASCE, Austin, September 1979, 797 - 800.**
10. Ingrassia, A. R., Saouma, V., Blandford, G., Chappell, J., "Crack Propagation in Rock and Concrete Structures", **Proc. International Symposium on Absorbed Specific Energy, C. Sih, E. Sgoboly, and H. Gillemot, Eds., Budapest, September, 1980, 207 - 221.**
11. Ingrassia, A. R., Ko, H. - Y., "Determination of Fracture Parameters for Rock", **Proc. of First USA - Greece Symposium on Mixed Mode Crack Propagation, National Technical University, Athens, Greece, August 18 - 22, 1980, G. C. Sih and P. S. Theocaris, Eds., Sijthoff & Noordhoff, Alphen aan den Rijn, the Netherlands, 1981, 349 - 365.**
12. Ingrassia, A. R., Abel, J. F., Kulhawy, F. H., "Interactive Computer Graphics for Analysis of Geotechnical Structures", **Proc. of the First International Conference on Computing in Civil Engineering, New York, N.Y, May 13 - 15, 1981, 864 - 875.**
13. Saouma, V. E., Ingrassia, A. R., "Fracture Mechanics Analysis of Discrete Cracking," **Proc. IABSE Colloquium on Advanced Mechanics of Reinforced Concrete, Delft, June, 1981, 393 - 416.**
14. Ingrassia, A. R., "Mixed - Mode Fracture Initiation in Indiana Limestone and Westerly Granite," **Proc. 22nd U.S. Symposium on Rock Mechanics, Cambridge, MA, June 29 - July 2, 1981, 186 - 191.**
15. Gerstle, W., Ingrassia, A. R., Gergely, P., "Tension Stiffening: A Fracture Mechanics and Interface Element Approach," **Proc. Int. Conf. on Bond in Concrete, Paisley, Scotland, June, 1982, 97 - 106.**
16. Kulhawy, F. H., Ingrassia, A. R., Huang, Y. - P., Han, T. - Y., Schulman, M. A., "Interactive Computer Graphics in Geomechanics," **Proc. 4th International Conference on Numerical Methods in Geomechanics, 3, Edmonton, Alberta, June 1982, 1181 - 1192.**
17. Ingrassia, A. R., Gunsallus, K. L., Beech, J. F., Nelson, P., "A Fracture Testing System for Prediction of Tunnel Boring Machine Performance," **Proc. 23rd U.S. Symposium on Rock Mechanics, Berkeley, California, August, 1982, 463 - 470.**
18. Abel, J. F., McGuire, W., Ingrassia, A. R., "Computer Graphics for 3 - D Structural Analysis," **Proc. of the ASCE 8th Conference on Electronic Computation, J. K. Nelson, Ed., Houston, Texas, February 21 - 23, 1983, 594 - 607.**
19. Perucchio, R., Ingrassia, A. R., "Computer Graphic Boundary Integral Analysis," **Proc. of the ASCE 8th Conference on Elect. Computation, J. K. Nelson, Ed., Houston, Texas, February 21 - 23, 1983, 422 - 435.**
20. Perucchio, R. S., Ingrassia, A. R., "Interactive Computer Graphic Surface Modeling of Three - Dimensional Solid Domains for Boundary Element Analysis," **Proc. NASA Symposium on Computer - Aided Geometry Modeling, Langley Research Center, Hampton, Virginia, April, 1983.**
21. Perucchio, R. S., Ingrassia, A. R., "Integrated Computer Graphic BEM Analysis System," **Proc. of the Fourth Engineering Mechanics Division Specialty Conference, ASCE, Volume I, Purdue University, West Lafayette, Indiana, May 23 - 25, 1983, 114 - 117.**
22. Ingrassia, A. R., Saouma, V., "Discrete Crack Modelling in Reinforced Concrete," **Proc. of the Fourth Engineering Mechanics Division Specialty Conference, ASCE, Volume II, Purdue University, West Lafayette, Indiana, May 23 - 25, 1983, 1105 - 1108.**
23. Perucchio, R., Han, T. - Y., Ingrassia, A. R., Abel, J. F., "Interactive Mesh Creation for Three - Dimensional Solids," **Proceedings of the U.S. - Sweden Workshop on CAD/CAM for Tooling and Forging Technology. Society of Manufacturing Engineers, Ithaca, New York, 1983, 33 - 38.**

24. Abel, J. F., Ingraffea, A. R., Perucchio, R., Han, T. - Y., Hajjar, J., "Interactive Computer Graphics for Finite Element, Boundary Element, and Finite Difference Methods", **Proc. of the 7th Invitational Symposium on the Unification of Finite Elements, Finite Differences, and Calculus of Variations**, Chapter 2, H. Kardestuncer, Ed., North-Holland, Amsterdam, 1984.
25. Shaffer, R., Thorpe, R., Ingraffea, A. R., Heuze, F., "Numerical and Physical Studies of Fluid - Driven Fracture Propagation in Jointed Rock," **Proc. of the 25th U.S. Symposium on Rock Mechanics**, SPE 12881, Evanston, Illinois, June, 1984, 113 - 126.
26. Abel, J. F., Ingraffea, A. R., McGuire, W., Greenberg, D. P., "Interactive Color Graphical Postprocessing as a Unifying Influence in Numerical Analysis Research," **Unification of Finite Element Software Systems**, H. Kardestuncer, Ed., North-Holland, Amsterdam, 1985, 21 - 38.
27. Kulhawy, F. H., Ingraffea, A. R., Han, T. - Y., Huang, Y. - P., "Interactive Computer Graphics in 3 - D Nonlinear Geotechnical FEM Analysis," **Proc. 5th International Conference on Numerical Methods in Geomechanics**, Nagoya, Japan, April, 1985.
28. Ingraffea, A. R., Wawrzynek, P. A., "Modeling of the Fracture Process Zone in Rock," **Rock Masses: Modeling of Underground Openings, Probability of Slope Failure, Fracture of Intact Rock**, C. H. Dowding, Ed., ASCE, publisher, 1985, 151 - 157.
29. Shaffer, R. J., Ingraffea, A. R., Heuze, F. E., "An Improved Model for Fluid - Driven Cracks in Jointed Rock," **Proc. of the 26th U.S. Symposium on Rock Mechanics**, Rapid City, South Dakota, June, 1985.
30. Gerstle, W. H., Ingraffea, A. R., "Error Control in Three-Dimensional Crack Modeling Using the Boundary Element Method", **Proc. of the Symposium on Advanced Topics in Boundary Element Analysis**, T. A. Cruse, A. Pifko, H. Armen, Eds., ASME, Orlando, Florida, November, 1985, 205 - 211.
31. Ingraffea, A. R., Panthaki, M., "Analysis of 'Shear Fracture Tests of Concrete Beams," **Finite Element Analysis of Reinforced Concrete Structures**, C. Meyer and H. Okamura, Eds., ASCE Publishers, 1986, 151 - 173.
32. Sabouni, A. R., El - Zanaty, A., Ingraffea, A. R., "Finite Element Discretization for Mixed - Mode Fracture Problems," **Proc. of the Ninth Conference on Electronic Computation**, K. M. Will, Editor, University of Alabama, Birmingham, February, 1986, 257 - 267.
33. Llorca, J., Elices, M., Ingraffea, A. R., "Propagacion de Fisuras en Estructuras de Hormigon" ("Crack Propagation in Concrete Structures"), **Proc. 11 Simposium sobre Aplicaciones del Metodo de los Elementos Finitos en Ingenieria**, Universitat Polite Unica de Catalunya, Barcelona. June. 1986, 25 - 40.
34. Gerstle, W. H., Ingraffea, A. R., "Boundary Element Modeling of Crack Propagation in Three Dimensions," **Proc. of the 2nd Boundary Element Technology Conference**. June 17-19, 1986, Cambridge, Massachusetts, J. Connors and C. Brebbia, Eds., 651 - 662.
35. Ingraffea, A. R., Mettam, K., Gerstle, W. H., "An Analytical and Experimental Investigation into Fatigue Cracking in Welded Crane Runway Girders," **Proc. 2nd International Conference on Structural Failure, Product Liability and Technical Insurance**. H. P. Rossmanith, Ed., Vienna, July 1 - 3, 1986, 201 - 223.
36. Wawrzynek, P. A., Ingraffea, A. R., "Local Automatic Remeshing Around a Propagating Crack Tip Using Interactive Computer Graphics," **Finite Element Method, Modeling, and New Applications**, E. M. Patton, H. Chung, F. Hatt, D. Hui, H. A. Kamel, Eds., ASME CED - Vol. 1, PVP - Vol. 101, 1986, 33 - 38.
37. O'Rourke, T. D., Ingraffea, A. R., Norman, R. S., Burnham, K. B., "Evaluation of Cased and Uncased Gas Pipelines at Railroads," **Proc. International Gas Research Conference**, Toronto, Ontario, September 1986.

38. Heuze, F. E., Shaffer, R. J., Ingraffea, A. R., "A Coupled Model for Fluid Driven Fractures," **Coupled Processes Associated with Nuclear Waste Repositories**. Ching - Fu Tsang, Ed., Academic Press, 1987, 655 - 662.
39. Shaffer, R., Heuze, F., Thorpe, R., Ingraffea, A. R., Nilson, R., "Models of Quasi - Static and Dynamic Fluid - Driven Fracturing in Jointed Rocks," **Proc. of the 6th Int. Congress on Rock Mech.**, Montreal, Canada, G. Herget and S. Vongpaisal, eds, A.A. Balkema/Rotterdam, 1987.
40. Thiercelin, M., Roegiers, J. C., Boone, T. J., Ingraffea, A. R., "An Investigation of the Material Parameters that Govern Behavior of Fractures Approaching Rock Interfaces," **Proc. of the 6th Intl. Congress on Rock Mech.** Montreal, Canada, G. Herget and S. Vongpaisal, Eds., A.A. Balkema/Rotterdam 1987, 263 - 269.
41. Swenson, D., Ingraffea, A. R., "A Finite Element Model of Dynamic Crack Propagation with an Application to Intersecting Cracks," **Proc. of the Fourth International Conference on Numerical Methods in Fracture Mechanics**, March 23 - 27, 1987, San Antonio, Texas, A. R. Luxmoore, D. R. J. Owen, Y. P. S. Rajapakse, and M. F. Kanninen, Eds, 191 - 204.
42. Wawrzynek, P., Boone, T., and Ingraffea, A. R., "Efficient Techniques for Modeling the Fracture Process Zone in Rock and Concrete," **Proc. of the Fourth International Conference on Numerical Methods in Fracture Mechanics**, March 23-27, 1987, San Antonio, Texas, A. R. Luxmoore, D. R. J. Owen, Y. S. Rajapakse, and M. F. Kanninen, Eds., 473 - 482.
43. Shaffer, R. J., Heuze, F. E., Thorpe, R. K. Ingraffea, A. R. and Nilson, R. H., "Models of Quasi-Static and Dynamic Fluid- Driven Fracturing in Jointed Rocks," **Proc. of the Fourth International Conference on Numerical Methods in Fracture Mechanics**, March 23-27, 1987, San Antonio, Texas, A. R. Luxmoore, D. R. J. Owen, Y. S. Rajapakse, and M. F. Kanninen, Eds, 505 - 518.
44. Boone, T. J. and Ingraffea, A. R.. "Simulation of the Fracture Process at Rock Interfaces," **Proc. of the Fourth International Conference on Numerical Methods in Fracture Mechanics**, March 23 - 27, 1987, San Antonio, Texas, A. R. Luxmoore, D. R. J. Owen, Y. P. S. Rajapakse, and M. F. Kanninen, Eds, 519 - 531.
45. Ingraffea, A. R., "Interactive Computer Simulation of Fracture Processes," **Proc. of the Fourth International Conference on Numerical Methods in Fracture Mechanics**, March 23 - 27, 1987, San Antonio, Texas, A. R. Luxmoore, D. R. J. Owen, Y. P. S. Rajapakse, and M. F. Kanninen, Eds, 677 - 699.
46. Ingraffea, A. R., Linsbauer, H.N., Rossmannith, H.P., "Computer Simulation of Cracking in a Large Arch Dam: Downstream Side Cracking," **Fracture of Concrete and Rock**, S. Shah and S. Swartz, Eds, Springer Verlag, New York, 1987, 334 - 342.
47. Ingraffea, A. R., Boone, T. J., "Simulation of Hydraulic Fracture Propagation in Poroelastic Rock," **Numerical Methods in Geomechanics**, G. Swoboda, editor, Balkema, Rotterdam, 1988, 95 - 105.
48. Wawrzynek, P., Martha, L., Ingraffea, A. R., "A Computational Environment for the Simulation of Fracture Processes in Three Dimensions," **Proc. of the Symposium on Analytical, Numerical, and Experimental Aspects of Three - Dimensional Fracture Processes**, A. Rosakis, Ed., Berkeley, CA, June, 1988, 321 - 327.
49. Kulhawy, F. H., Gunsallus, K. L., Ingraffea, A. R., and Wong, C. - W. Patrick, "Some Recent Developments in Interactive Computer Graphics for 3 - D Nonlinear Geotechnical FEM Analysis," **Numerical Methods in Geomechanics**, G. Swoboda, Ed., Balkema, Rotterdam, 1988, 121 - 134.
50. Boone, T. J., Ingraffea, A. R., "Simulation of Fracture Propagation in Poroelastic Materials with Application to the Measurement of Fracture Parameters," **Fracture Toughness and Fracture Energy: Test Methods for Concrete and Rock**, Mihashi, H., Takahashi, H., Wittman, F., Eds., A.A. Balkema, Rotterdam, 1989, 325 - 344.
51. Grigoriu, M., El Borgi, S., Saif, M., and Ingraffea, A. R., "Probabilistic Prediction of Mixed Mode Fracture Initiation and Trajectory Under Random Stresses," **Probabilistic Methods in Civil Engineering**, Spanos, P.D.,

- Ed., Proceedings of the 5th ASCE Specialty Conference, May 25 - 27, 1988, Blacksburg, Virginia, ASCE, 1988, 61 - 64.
52. Shaffer, R. J., Heuze, F. E., Thorpe, R. K., Ingraffea, A. R., and Nilson, R. H., "Models of Quasi - Static and Dynamic Fluid - Driven Fracturing in Jointed Rocks," **Fracture of Concrete and Rock**, S. P. Shah and S. E. Swartz, Eds., Springer - Verlag, New York, 1989, 189 - 198.
  53. Boone, T. J., Ingraffea, A. R., "An Investigation of Poroelastic Effects Related to Hydraulic Fracture Propagation in Rock and Stress Measurement Techniques," **Proc. of the 30th U.S. Symposium on Rock Mechanics**. A. W. Khair, Ed., A. A. Balkema, Publisher, Rotterdam, 1989, 73 - 80.
  54. A. R. Ingraffea, H. Linsbauer, H. Rossmannith, "Computer Simulation of Cracking in a Large Arch Dam Downstream Side Cracking," **Fracture of Concrete and Rock**, S. P. Shah and S. E. Swartz, Eds., Springer-Verlag, New York, 1989, 334 - 342.
  55. Gunsallus, K., Kulhawy, F., Ingraffea, A. R., "A Geotechnical Analysis System with Applications for Drilled Shaft Foundations," **Foundation Engineering: Current Principles and Practices**, Vol. 1, F. H. Kulhawy, Ed., ASCE, New York, 1989, 640 - 653.
  56. Wong, P., Kulhawy, F., Ingraffea, A. R., "Numerical Modeling of Interface Behavior for Drilled Shaft Foundations Under Generalized Loadings," **Foundation Engineering: Current Principles and Practices**, F. Kulhawy, Ed., ASCE, New York, 1989, 565 - 579.
  57. Wawrzynek, P., Martha, L., Ingraffea, A. R., "FRANSYS: A Software System for the Simulation of Crack Propagation in Three - Dimensions," **Proceedings of Symposium on Discretization Methods in Structural Mechanics**. IUTAM/IJACM, H. Mang and G. Kuhn, Eds., Vienna, June, 1989, 273-282.
  58. Lamkin, S. J., Wawrzynek, P. A. and Ingraffea, A.R., "Two - Dimensional Numerical Simulation of Interacting Fractures in Rock," **Fracture of Concrete and Rock: Recent Developments**, S. P., Shah, S.E. Swartz, B. Barr, Eds., Elsevier Science Publishing, New York, N.Y., 1989, 121 - 131.
  59. Sousa, JL., Martha, LF., Wawrzynek, PA. and Ingraffea, AR., "Simulation of Non - Planar Crack Propagation in Three - Dimensional Structures in Concrete and Rock," **Fracture of Concrete and Rock: Recent Developments**, S. P., Shah, S.E. Swartz, B. Barr, Eds., Elsevier Science Publishing, New York, N.Y., 1989, 254 - 264.
  60. Gaisbauer, HR., Ingraffea AR., Rossmannith, HP., Wagner, E., "Bruchmechanische Überlegungen Bei Gewölbesperren", **Proceedings of the 6th International Seminar on Hydraulic Structures**, Vienna, November 13-15, 1990, 215-230.
  61. Ingraffea, AR., Grigoriu, MD., Swenson, DV., "Representation and Probability Issues in the Simulation of Multi-Site Damage", **Structural Integrity of Aging Airplanes**, S. Atluri, S. Sampath, P. Tong (Eds.), Springer Verlag, Berlin, 183-197, 1991.
  62. Bittencourt, TN. Wawrzynek, PA., Ingraffea, AR., "Simplified Micro-Modelling of Failure in Unidirectional Composites", to appear in the **Proceedings of the 5th Int. Conference on Numerical Methods in Fracture Mechanics**, Freiburg, West Germany, April, 1990.
  63. Ingraffea, AR., Bittencourt, T., and Sousa, JL., "Automatic Fracture Propagation for 2D Finite Element Models", **Proc. of the XI Ibero-Latin American Congress on Computational Methods in Engineering**, Rio de Janeiro, November, 957-982, 1990.
  64. Lutz, E., Gray, L., and Ingraffea, AR., "Indirect Evaluation of Surface Stress in the Boundary Element Method," in **Boundary Integral Methods**, L. Morino and R. Piva, Eds., Springer Verlag, Berlin, 339-348, 1991.

65. Lutz, E., Wawrzynek, P., and Ingraffea, AR., "Using Parameterized Gaussian Quadrature in the 2D BEM for Elasticity", **Computational Engineering with Boundary Elements, Vol. 2: Solid and Computational Problems**, A. H-S. Cheng, C. A. Brebbia, S. Grille, Eds., Computational Mechanics Publications, 1990.
66. Sousa, JL., Ingraffea, AR., "A Numerical, Energy-Based Approach for Three-Dimensional Fracture Propagation", **Computer Methods and Mechanics - Proceedings of the Seventh Int. Conf. on Comp. Meth. and Advances in Geomech.**, Beer, G. Booker, J., Carter, J. (eds.), Balkemo, Rotterdam, 2, 1653-1658, 1991.
67. Ingraffea, AR., O'Rourke, T. D., Stewart, H. S., Barry, A., Crossley, C., "Guidelines for Uncased Crossings of Highways and Railroads", **Pipeline Crossings**, J. P. Castronovo, Ed., ASCE, New York, 34-46, 1991.
68. TD. O'Rourke, KB. Burnham, BM. New, HE. Stewart, AR. Ingraffea, "Practice and Performance Record for Pipelines at Railroad and Highway Crossings", **Pipeline Crossings**, J. P. Castronovo, Ed., ASCE, New York, 248-262, 1991.
69. TD. O'Rourke, HE. Stewart, AR. Ingraffea, S. El Gharbawy, "Influence of Soil-Pipeline Stiffness on Bending Stresses from Surface Loading", **Pipeline Crossings**, J. P. Castronovo, Ed., ASCE, New York, 406-417, 1991.
70. Bittencourt, T., Ingraffea, AR., Llorca, J., "Simulation of Arbitrary, Cohesive Crack Propagation", **Fracture Mechanics of Concrete Structures**, Z. Bazant, Editor, Elsevier Applied Science, New York, 339-350, 1992.
71. Zehnder, A., Viz, M., Ingraffea, AR., "Fatigue Fracture in Thin Plates Subjected to Tensile and Shearing Loads: Crack Tip Fields, J-Integral and Preliminary Experimental Results", **Proc. of the VII Int. Cong. Exp. Mech.**, Soc. Exp. Mech., Bethel, CT, 44-50, 1992.
72. Gaisbauer, H., Rossmannith, H-P., Ingraffea, AR., "Die Auswirkungen eines wasserseitlichen Horizontalrisses in der Nähe der Aufstandsfläche auf verschiedene Gewölbesperrentypen", **Proceedings of the 7th Internationales Seminar der Wasserkraftanlagen**, Königsberger, A., *et al*, Editors, Wien, Austria, November, 1992, 143-157.
73. Lutz, E., Gray, L., Ingraffea, AR., "An Overview of Integration Methods for Hypersingular Boundary Integrals", **Boundary Elements XIII**, C. Brebbia and G. Gipson, Editors, Computational Mechanics Publications, Elsevier Applied Science, 913-925, 1991.
74. Andrews, JR., Stinehour, JE., Lean, MH., Potyondy, DO., Wawrzynek, PA., Ingraffea, AR., Rainsdon, MD., "Holographic Display of Computer Simulations," **Practical Holography V**, S.A. Benton, Ed., SPIE Vol. 1461, Bellingham, Washington, 110-123, 1991.
75. Potyondy, D., Ingraffea, AR., "A Methodology for Simulation of Curvilinear Crack Growth in Pressurized Fuselages", **Durability of Metal Aircraft Structures: Proc. Int. Workshop Struct. Integrity Aging Airplanes**, S. N. Atluri et al, Eds., Atlanta Technology Publications, Atlanta, 217-230, 1992.
76. Ingraffea, AR, "Computer-Aided Engineering", **Proceedings of the U.S.-Canada Workshop on Recent Accomplishments and Future Trends in Geomechanics in the 21st Century**, Zaman, Desai, Selvadurai, Editors, University of Oklahoma, October 21-23, 124-127, 1992.
77. Grigoriu, M, Ingraffea, AR, "Probability-Based Inspection Planning", **Proceedings of the International Symposium on Structural Integrity of Aging Airplanes**, 231-242, Atlanta, Georgia, March 20 - 22, 1992.
78. Morales, H. Brady, B, Ingraffea, AR, "Three-Dimensional Analysis and Visualization of the Wellbore and the Fracturing Process in Inclined Wells", Paper SPE25889, **Society of Petroleum Engineers Joint Rocky Mountain Regional Meeting and Low Permeability Reservoirs Symposium**, Denver, CO, April 12-14, 1993.
79. Dyskin, A, Germanovich, L, Ingraffea, AR, Lee, K, Ring, L, "Modeling Crack Propagation in Compression", **Rock Mechanics: Models and Measurements Challenges from Industry**, Proceedings of the First North American Rock Mechanics Symposium, P. Nelson, S. Laubach, Eds., A. A. Balkema, Rotterdam, 451-462, 1994.

80. Bittencourt, T, Ingraffea, AR, "Three Dimensional Cohesive Crack Analysis of the Short Rod Fracture Toughness Test Specimen", **Computer Modeling of Concrete Structures**, Proceedings of EURO-C 1994 International Conference, H. Mang, N. Bicanic, R. De Borst, Editors, Pineridge Press Ltd., Swansea, UK, 1-16, 1994.
81. Carter, B, Wawrzynek, P, Ingraffea, AR, "Hydraulic Fracture from the Interface of a Cased Wellbore", **Rock Mechanics: Models and Measurements Challenges from Industry**, Proceedings of the First North American Rock Mechanics Symposium, P. Nelson, S. Laubach, Eds., A. A. Balkema, Rotterdam, 185-192, 1994.
82. Carter, B, Ingraffea, AR, "Effects of Casing and Interface Behavior on Hydraulic Fracture", **Computer Methods and Advances in Geomechanics**, H. Siriwardane and M. Zaman, Eds., A. A. Balkema, Rotterdam, 2, 1561-1566, 1994.
83. Wawrzynek, P, Carter, B, Potyondy, D, Ingraffea, AR, "Topological Approach to Modeling Arbitrary Crack Propagation in 3D", **DIANA Computational Mechanics '94**, G.M.A. Kusters and M.A.N. Hendriks, Eds., Kluwer Academic Publishers, 69-94, 1994.
84. Potyondy, DO, Wawrzynek, P, Ingraffea, AR, "Discrete Crack Growth Analysis Methodology for Through Cracks in Pressurized Fuselage Structures", **Proc. of FAA/NASA International Symposium of Advanced Structural Integrity Methods for Airframe Durability and Damage Tolerance**, C. Harris, Ed., NASA Conference Pub. 3274, 581-602, 1994.
85. Bittencourt, TN, Ingraffea, AR, "A Numerical Model for 3D Cohesive Cracking", **Proceeding of the XV CILAMCE Conference**, Belo Horizonte, Brazil, 1, 849-858, 1994.
86. Carter, BJ, Ingraffea, A R, Bittencourt, T N, "Topological Control of the Modeling of Linear and Nonlinear 3D Crack Propagation in Geomaterials", **Fracture of Brittle Disordered Materials: Concrete, Rock, and Ceramics**, B. L. Karihaloo and G. Baker, Eds., E&FN Spon, Publishers, London, 301-318, 1995.
87. Carter, B, Dyskin, A, Germanovich, L, Ingraffea, AR, Ring, L, Ustinov, K, "3-D Numerical Simulation of Crack Growth and Interaction in Compression", **Proceedings of the 8th International Congress on Rock Mechanics**, Tokyo, September, 1, 219-226, 1995.
88. Ingraffea, AR, Carter, B, Wawrzynek, P, "Application of Computational Fracture Mechanics to Repair of Large Concrete Structures", **Fracture Mechanics of Concrete Structures**, Part 3, F. Wittman Edt., AEDIFICATIO Publishers, 1995.
89. Ingraffea, AR, Wawrzynek, P, "FRANC2D: A Case Study in Transfer of Software Technology", **Research Transformed into Practice: Implementations of NSF Research**, J. Colville, A. Amde, Eds., ASCE Press, New York, 233-344, 1995.
90. Germanovich, LN, Carter, BJ, Ingraffea, AR, Dyskin, AV, Lee, KK. "Mechanics of 3D Crack Growth in Compression," in **Rock Mechanics Tools and Techniques**, 2nd North American Rock Mechanics Symposium, Montreal, Canada, Aubertin, Hassani & Mitri (eds), Balkema, Rotterdam, p. 1151-1160, 1996.
91. Chen, C-S, Wawrzynek, PA, Ingraffea, AR, "Simulation of Stable Tearing and Residual Strength Prediction with Applications to Aircraft Fuselages", **Proceedings of the FAA/NASA Symposium on Continued Airworthiness of Aircraft Structures**, August 28-30, Atlanta, GA, 605-618, 1996.
92. Carter, BJ, Chen, C-S, Ingraffea, AR, Wawrzynek, P.A. "A Topology-Based System for Modeling 3D Crack Growth in Solid and Shell Structures ", **Proceedings of the Ninth International Congress on Fracture**, Sydney, Australia, Elsevier Science Publishers, April, 1923-1934, 1997 .
93. Ingraffea, AR, Gray, L, Wawrzynek, P, "A New Boundary Element Formulation for the Simulation of Damage in Composite Joints", to appear in the **Proceedings of the 38th AIAA/ASME/ASCE/AHS/ASC Structural Dynamics and Materials Conference**, April, 1997.

94. Chen, C.-S , Wawrzynek, PA, and Ingraffea, AR, "Methodology for Fatigue Crack Growth and Residual Strength Prediction with Applications to Aircraft Fuselages," to appear in the **Proceedings of the IUTAM Symposium: Innovative Computational Methods for Fracture and Damage**, Dublin, Ireland, 1997.
95. Chen, C.-S, Wawrzynek, PA, and Ingraffea, AR, "Recent Advances in Numerical Simulation of Stable Crack Growth and Residual Strength Prediction," **Proceedings of the Sixth East Asia-Pacific Conference on Structural Engineering & Construction**, Taipei, Taiwan, 1773-1778, 1998.
96. CR Myers, SR Arwade, E Iesulauro, PA Wawrzynek, M Grigoriu, AR Ingraffea, PR Dawson, MP Miller, and JP Sethna, "Digital Material: a Framework for Multiscale Modeling of Defects in Solids", to appear in **Proceedings of Symposium J: Multiscale Materials Modeling**, Materials Research Society Fall 1998 Meeting, Materials Research Society, 1998.
97. Hanson, JH. and Ingraffea, AR., "Behavior of Concrete Round Double Beam Fracture Toughness Test Specimens," **Proceedings Third International Conference on Fracture Mechanics of Concrete and Concrete Structures**, International Association of Fracture Mechanics for Concrete and Construction Standards (IAFramCoS), Gifu, Japan, Vol. 1, pp 441-452, 1998.
98. Ingraffea, AR., Chen, D, Wawrzynek, P, "How Long Can They Fly? Computer Simulation and the Aging Aircraft Problem", **Proc. 39<sup>th</sup> Israel Annual Conf. Aerospace Sciences**, Tel Aviv, 2-1:2-16, 1999.
99. Arwade, S, Grigoriu, M, Ingraffea, A, Miller, M. "Crack Growth in Stochastic Microstructures", **Stochastic Structural Dynamics**, Spencer, B. F. & Johnson, E. A., Eds., Balkema, Rotterdam, 265-272, 1999.
100. Lewicki, D, Spievak, L, Wawrzynek, P, Ingraffea, A, Handschuh, R, "Consideration of Moving Tooth Load in Gear Crack Propagation Predictions", **Proc. ASME DETC 2000**, Paper DETC2000/PTG-14386, Baltimore, MD, Sept. 10-13, 2000, 10 pp. Also, NASA/TM-2000-210227.
101. Carter, B, Chen, C.-S, Chew, P, Chrisochoides, N, Gao, G, Heber, G, Ingraffea, A, Krause, R, Myers, C, Nave, D, Pingali, K, Stodghill, P, Vavasis, S, Wawrzynek, P, "Parallel FEM Simulation of Crack Propagation-Challenges, Status, and Perspectives", **Lecture Notes in Computer Science**, vol. 1800, Springer Verlag, 2000.
102. Gall, K., Iesulauro, E., Hui, H., Ingraffea, A., "Atomistic and continuum based fracture modeling in single crystal Silicon", in **Advances in Computational Engineering & Sciences 2000**, Volume II, Satya N. Atluri and Frederick W. Brust, editors, 2000-2006, Tech Science Press, 2000.
103. Hanson, J. H. and Ingraffea, A. R., "Comparison of Measured Fracture Toughness and Size Independent Fracture Toughness for Concrete", in **Advances in Fracture: Proceedings of ICF 10**, Honolulu, Hawaii, December 4-7, 2001, ICF100775OR.
104. E. Iesulauro, K. Dodhia, T. Creteigny, C-S. Chen, C. Myers, and A.R. Ingraffea, "Continuum-Atomistic Modeling for Crack Initiation and Propagation in Polycrystals," in **Advances in Fracture: Proceedings of ICF 10**, Honolulu, Hawaii, December 4-7, 2001, ICF100157OR.
105. C Myers, C-S Chen, T Creteigny, N P Bailey, A J Dolgert, L O Eastgate, M Rauscher, J P Sethna, E Iesulauro, A R Ingraffea, "Software methodologies for multiscale descriptions of defects, deformation and fracture", in **Advances in Fracture: Proceedings of ICF 10**, Honolulu, Hawaii, December 4-7, 2001, ICF100913OR.
106. B.J. Carter, A.R. Ingraffea, and Yeh-Hung Lai, "Simulating transverse fracturing of thin plastic sheet", in **Advances in Fracture: Proceedings of ICF 10**, Honolulu, Hawaii, December 4-7, 2001, ICF100472OR.
107. Hanson, J. H. and Ingraffea, A. R., 2001, "On the Accuracy of Fracture Toughness Test Results for Concrete Using Different Size and Geometry Specimens and Data Reduction Methods," **Fracture Mechanics for Concrete Materials: Testing and Applications**, ACI SP-201, C. Vipulanandan and W. H. Gerstle, Eds., American Concrete Institute, Farmington Hills, MI, pp. 111-132.

108. T.-S. Han, S.L. Billington, and A.R. Ingraffea, "Simulation strategies for RC building under seismic loading," In R. de Borst, J. Mazars, G. Pijaudier-Cabot, and J.G.M van Mier (Eds.), **Proceedings of the fourth international conference of fracture mechanics of concrete and concrete structures**, Cachan, France, 28 May – 1 June 2001, pp. 933-940.
109. T.-S. Han, S.L. Billington and A.R. Ingraffea, 2002, "Simulation strategies to predict seismic response of RC structures," ACI Special Publication, 2002.
110. Iesulauro, E., Creteigny, T., Chen, C.-S., Dodhia, K., Myers, C., Ingraffea, A. R., **Analytical and Computational Fracture Mechanics of Non-Homogeneous Materials, Proceedings of the IUTAM Symposium**, Cardiff, 18-22, 2001, Kluwer Academic Publishers, Dordrecht, pp. 167-177, 2002.
111. L. Paul Chew, N. Chrisochoides, S. Gopalsamy, G. Heber, A. R. Ingraffea, E. Luke, J. B. Cavalcante Neto, K. Pingali, A. Shih, B. K. Soni, P. Stodghill, D. Thompson, S. A. Vavasis, P. A. Wawrzynek: Computational Science Simulations Based on Web Services. **International Conference on Computational Science 2003**: 299-308.
112. E. Anagnostou, A. Brahme, C. Cornwell, B.S. El-Dasher, J. Fridy, M. F. Horstemeyer, A. R. Ingraffea, S.-B. Lee, A. Maniatty, R. Noack, J. Papazian, A.D. Rollett, D. Saylor, H. Weiland, "Simulation of Fatigue Crack Initiation and Propagation in Aluminum Alloys using Realistic Microstructures", **Proc. 11<sup>th</sup> Int. Conf. Fracture**, Turin, Italy, March 20-25, 2005.
113. J. Emery, P. Wawrzynek, A. R. Ingraffea, "DDSIM: A Next Generation Damage and Durability Simulator", **Proc. 11<sup>th</sup> Int. Conf. Fracture**, Turin, Italy, March 20-25, 2005.
114. Oneida E.K., van der Meulen M.C.H., Ingraffea A.R. Finite element-based methodology for studying crack propagation at the microstructural length-scale in cortical bone. **17th Annual Symposium on Computational Methods in Orthopaedic Biomechanics**. Feb. 21, 2009.
115. J.D. Hochhalter, A.D. Spear, A.R. Ingraffea, "Crack trajectory prediction in thin shells using finite element analysis", **Proc. 6th International Conference on Computation of Shell & Spatial Structures**, Ithaca, NY USA, 2008.
116. A.D. Spear, A.R. Ingraffea, "Residual strength prediction of damaged aircraft structure using 3D finite element modeling", **Proc NASA Aviation Safety Technical Conference**, Denver, CO, 2008.
117. Hochhalter J., Glaessgen E., Ingraffea A., Aquino W. "A Method for Combining Experimentation and Molecular Dynamics Simulation to Improve Cohesive Zone Models", **Proc 12th International Conference on Fracture**. Ottawa, Canada. July 2009.
118. Wawrzynek, P.A., Carter, B.J., and Ingraffea, A.R., "Advances in Simulation of Arbitrary 3D Crack Growth using FRANC3D/NG," **Proc. 12th International Conference on Fracture**. Ottawa, Canada. July 2009.
119. Oneida E.K., van der Meulen M.C.H., Ingraffea A.R. Relationships among microstructural features and crack propagation in osteonal bone identified using finite element analysis. **Proc. 12th International Conference on Fracture**. Ottawa, Canada. July 2009.
120. J.E. Bozek, M.G. Veilleux, J.D. Hochhalter, P.A. Wawrzynek, A.R. Ingraffea. Stochastic Framework for Predicting Microstructurally Small Fatigue Life of AA 7075-T651. **Proc. 12th International Conference on Fracture**. Ottawa, Canada. July 2009.
121. A.D. Spear, J.D. Hochhalter, A.R. Ingraffea, "Simulation of discrete-source damage propagation and residual strength of aircraft structures", **Proc. 12th International Conference on Fracture**. Ottawa, Canada. July 2009.

122. A. R. Ingraffea, P. Brune, R. Perucchio, "The Toughness of Ancient Roman Concrete", **Proceedings of the 7<sup>th</sup> Int. Conf. of Fracture Mechanics of Concrete and Concrete Structures**, Jeju Island, South Korea, May, 2010.
123. Spear AD, Veilleux MG, Bozek JE, Ingraffea AR. Structural Assessment and Prognosis Using a Multiscale Fracture Mechanics-Based Approach, Proc. 2010 Aircraft Airworthiness & Sustainment Conference, 2010.
124. Spear AD, Ingraffea AR. Microstructurally Small Fatigue-Crack Growth in Thin Aluminum Alloy Pressure Vessel Liner, *Procedia Engineering*, 10, ICM11, 2011, 686-691.

### **Publications on Engineering Education**

1. Abel J F, McGuire W, Ingraffea A R. In the Vanguard of Structural Engineering. *Engineering: Cornell Quarterly*, 16, 3, Winter 1981 - 82, 23 - 36.
2. Ingraffea AR, Mink C. Why Cornell Engineers Have Up - to - Date Design Skills. *Engineering: Cornell Quarterly*, 21, 2, Winter 1986 - 87, 18 - 24.
3. Ingraffea AR. Workstations Redefine the Learning Process. *EDU Magazine*, Special Edition, Summer, 1988, 2 - 4.
4. Ingraffea AR, Mink K. Project SOCRATES: Fostering a New Collegiality. *Academic Computing*, 3, 3, 1988, 20 - 21, 60 - 63.
5. Abel JF, Ingraffea AR. Use of Interactive Graphics Programs for Instruction in Structural Engineering. **Proceedings of CATS' 90**, E. Onate *et al*, Eds., CIMNE-Pineridge Press, Barcelona, Spain, 1990, 491- 495.
6. Goldbaum SL, Ingraffea AR. Cornell University's Project SOCRATES. **Proceedings of CATS' 90**, E. Onate *et al*, Eds., CIMNE-Pineridge Press, Barcelona, Spain, 1990, 270- 273.
7. Ingraffea AR, Wawrzynek P. Teaching Fracture Mechanics to Graduate Students with Workstation-Based Simulation. **Proceedings of the Advanced Workshop on Teaching and Education in Fracture and Fatigue Analysis and Prevention**, Vienna, Austria, July 10, 1992.
8. Ingraffea AR, Agogino A, Sheppard S. Expanding the Role of the Computer in Engineering Education. **Computer Methods and Advances in Geomechanics**, H. Siriwardane and M. Zaman, Eds., A. A. Balkema, Rotterdam, 1, 189-196, 1994.
9. Pauschke JM, Ingraffea AR. Recent Innovations in Civil Engineering Curricula. *Journal of Professional Issues in Engineering Education and Practice*, 122, 3, July, 123-133, 1996.
10. Polaha M, Ingraffea AR. Cracking Dams. <http://www.simsience.org>, 1999.
11. Davidson BD, Davidson R, Gay G, Ingraffea AR, Miller M, Nozick L, Zehnder A, Sheckler R, Rath C. Distance Design Collaboration Through an Advanced Interactive Discovery Environment. **Proceedings of the 2002 ASEE Annual Conference & Exposition**, Session 1302, Montreal, Quebec, Canada, June 2002.
12. Davidson B D, Davidson R, Gay G, Ingraffea A, Miller M, Nozick L, Zehnder A, Sheckler R, Rath C. Collaborative Distance Design of Aerospace Structures. **Proceedings of the 32nd ASEE/IEEE Frontiers in Education Conference**, Session F4F, Boston, MA, November 2002.
13. Lee J-S, Cho HC, Gay G, Davidson BD, Ingraffea, AR. Technology Acceptance and Social Networking in Distance Learning," *Educational Technology and Society*, Volume 6, No. 2, 2003, pp. 60-61 (available at <http://ifets.ieee.org/periodical/6-2/index.html>).

14. Davidson BD, Dannenhoffer JF, Ingraffea A, Jones S, Zehnder A. Facilitating Effective, Geographically Distributed Engineering Design Teams. **Proceedings of the 2003 Frontiers in Education Conference**, Paper 0-7803-7444-4/03, Boulder, Colorado, November 5-8, 2003.
15. Davidson BD, Dannenhoffer JF, Gay G, Ingraffea A, Jones S, Lee J-S, Stefanone M, Zehnder A. On the Use of Advanced IT Tools to Facilitate Effective, Geographically Distributed Student Design Teams. **Proceedings of the 2003 ASEE Annual Conference**, Nashville, Tennessee, June 2003.
16. Dannenhoffer JF, Davidson, BD, Ingraffea AR, Jones S, Zehnder A. A Case Study on Educating Engineers for Geographically-Dispersed Design Teams. **Proceedings of the 2003 International Mechanical Engineering Congress and R&D Exposition**, Paper IMECE2003-41530, Washington, D.C., November 16 - 21, 2003.
17. Stefanone, M, Hancock, J, Gay, G, Ingraffea, AR. Emergent networks, locus of control, and the pursuit of social capital. **Proceedings of the 2004 ACM conference on Computer supported cooperative work** Chicago, Illinois, USA, 592 – 595, 2004.
18. Cho H, Gay G, Davidson B, Ingraffea AR (2007). Social networks, communication styles, and learning performance in a CSCL community. *J. Computers & Education*, 49(2), 309-329.
19. Cho H, Gay G, Davidson B, Ingraffea AR. (forthcoming). The effect of communication styles on computer-supported collaborative learning. In C. Mourlas, N. Tsianos, & P. Germanakos (eds.)/ *Cognitive and Emotional Processes in Web-based Education: Integrating Human Factors and Personalization/ PA: IGI Global.*
20. Zehnder AT, Ingraffea AR, Davidson BD, "On Synchronous, IP-Based, Collaborative Engineering Design Education," *Distance Education Research Trends*, Nova Science Publishers, Inc. (In Press).

## REPORTS

1. Ingraffea, A. R., "Twin and Two - Lobed Tank Tradeoff Study, I," Report B31 - 193M0 - 13, Grumman Aerospace Corporation, Bethpage, N.Y., 1970.
2. Ingraffea, A. R., "Twin and Two - Lobed Tank Tradeoff Study, II," Report B35 - 193M0 - 19, Grumman Aerospace Corporation, Bethpage, N.Y., 1970.
3. Ingraffea, A. R., Trent, B., "Coal Model Testing," in 1975 Annual Report to U.S. Bureau of Mines, Grant G - 0110894, pp. 205 - 249.
4. Beech, J., Ingraffea, A. R., "Three - Dimensional Finite Element Stress - Intensity Factor Calibration of the Short - Rod Specimen", *Geotechnical Engineering Report 80 - 3*, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1980.
5. Manu, C., Ingraffea, A. R., "Three - Dimensional Finite Element Analysis of Cyclic Fatigue Crack Growth of Multiple Surface Flaws," *Department of Structural Engineering, Cornell University, Ithaca, N.Y., May, 1980, 223 pp.*
6. Saouma, V. E., Ingraffea, A. R., Catalano, D. M., "Fracture Toughness of Concrete -  $K_{Ic}$  Revisited," *Department of Structural Engineering Report 80 - 9*, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1980.
7. Blandford, G. E., Ingraffea, A. R., Liggett, J. A., "Automatic Two - Dimensional Quasi - Static and Fatigue Crack Propagation Using the Boundary Element Method," *Department of Structural Engineering Report 81 - 3*, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1981.
8. Saouma, V., Ingraffea, A. R., Gergely, P., White, R. N., "Interactive Finite Element Analysis of Reinforced Concrete: A Fracture Mechanics Approach," *Department of Structural Engineering Report 81 - 5*, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1981.

9. Hungspreug, S., Gergely, P., Ingraffea, A. R., White, R. N., "Local Bond Between a Reinforcing Bar and Concrete Under High Intensity Cyclic Load," Department of Structural Engineering Report 81 - 6, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1981.
10. Chappell, J. F., Ingraffea, A. R., "A Fracture Mechanics Investigation of the Cracking of Fontana Dam," Department of Structural Engineering Report 81 - 7, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1981.
11. Arrea, M., Ingraffea, A. R., "Mixed - Mode Crack Propagation in Mortar and Concrete," Department of Structural Engineering Report 81 - 13, School of Civil and Environmental Engineering, Cornell Univ., Ithaca, N.Y., 1981.
12. Catalano, D., Ingraffea, A. R., "Concrete Fracture: A Linear Elastic Fracture Mechanics Approach," Department of Structural Engineering Report 82 - 1, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., 1982.
13. Ingraffea, A. R., "An Experimental Study of Propagation of Cracks Near Interfaces in Rock," Department of Structural Engineering Report 82 - 4, School of Civil and Environmental Engineering, Cornell University, February, 1982, 45 pp.
14. Gerstle, W., Ingraffea, A. R., Gergely, P., "The Fracture Mechanics of Bond in Reinforced Concrete," Department of Structural Engineering Report 82 - 7, School of Civil and Environmental Engineering, Cornell University, Ithaca, N.Y., June, 1982, 144 pp.
15. Huang, Y. - P., Kulhawy, F. H., Ingraffea, A. R., "Nonlinear Incremental, 2 - D and 3 - D Finite Element Analysis of Geotechnical Structures Using Interactive Computer Graphics," Geotechnical Engineering Report 83 - 8, School of Civil and Environmental Engineering and Program of Computer Graphics, Cornell University, Ithaca, N.Y., August, 1983, 338 pp.
16. Perucchio, R. S., Ingraffea, A. R., "An Integrated Boundary Element Analysis System with Interactive Computer Graphics for Three Dimensional Linear - Elastic Fracture Mechanics," Department of Structural Engineering Report 84 - 2, School of Civil and Environmental Engineering and Program of Computer Graphics, Cornell University, Ithaca, N.Y., January, 1984.
17. Nelson, P. P., O'Rourke, T. D., Flanagan, R. F., Kulhawy, F. H., Ingraffea, A. R., "Tunnel Boring Machine Performance Study," Report UMTA - MA - 06 - 0100 - 84, U.S. Department of Transportation, Washington, D.C., January, 1984.
18. Ahmed, I., O'Rourke, T. D., Perucchio, R. S., Kulhawy, F. H., Ingraffea, A. R., "Analytical Study of Cast Iron Pipeline Response to Shallow Trench Construction," Report to New York Gas Group, Geotechnical Engineering Report 84 - 2, Cornell University, May, 1984.
19. Gerstle, W. H., Ingraffea, A. R., "Numerical Modelling of Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders Due to Wheel Loads," Task II, Report No. 1, Document 84 - 3, AISE/Cornell University Crane Runway Girder Project, May 15, 1984, 108 pp.
20. Wawrzynek, P., Ingraffea, A. R., "The Effect of Stiffeners on the Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders," Task II, Report No. 3, Document 85 - 3, AISE/Cornell University Crane Runway Girder Project, January 20, 1985, 50 pp.
21. Ingraffea, A. R., Lin, S. C., "Effects of Elastomeric Rail Pad on Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders," Task II, Report No. 2, Document 85 - 2, AISE/Cornell University Crane Runway Girder Project, March 5, 1985, 45 pp.
22. Ingraffea, A. R., Shaffer, R. J., Heuze, F. E., "FEFFLAP: A Finite Element Program for Analysis of Fluid - Driven Fracture Propagation in Jointed Rock, Volume I: Theory and Programmer's Manual," University of

- California Information Document 20368, Report to U.S. Department of Energy under Contract W - 7405 - ENG - 48, March, 1985.
23. Shaffer, R. J., Ingraffea, A. R., Heuze, F. E., "FEFFLAP: A Finite Element Program for Analysis of Fluid - Driven Fracture Propagation in Jointed Rock, Volume II: User's Manual and Model Verification," University of California Information Document 20368, Report to U.S. Department of Energy under Contract W - 7405 - ENG - 48, March, 1985.
  24. Gerstle, W. H., Ingraffea, A. R., "Finite and Boundary Element Modelling of Crack Propagation in Two - and Three - Dimensions Using Interactive Computer Graphics," Department of Structural Engineering Report 85 - 8, School of Civil and Environmental Engineering and Program of Computer Graphics, Cornell University, Ithaca, N.Y., October 1985.
  25. O'Rourke, T. D., Ingraffea, A. R., Stewart, H. E., Panozzo, G. L., Blewitt, J. R., Tawfik, M. S., "State - of - the - Art Review: Current Practices for Pipeline Crossings at Railroads," Topical Report. GRI - 86/0209 and 0210, Gas Research Institute, Contract No. 5085 - 271 - 1147, February 1986.
  26. Sabouni, A. - R., Loizias, M., Sutharshana, S., Ingraffea, A. R., "Finite Element Analysis of a Reinforced Concrete Beam," Department of Structural Engineering Research Report 82 - 17, School of Civil and Environmental Engineering, Cornell University, March, 1986, 51 pp.
  27. Sabouni, A. - R., Elzanaty, A., Ingraffea, A. R., "Finite Element Idealization of Mixed - Mode Fracture," Department of Structural Engineering Research Report 83 - 9, School of Civil and Environmental Engineering, Cornell University, March 1986, 58 pp.
  28. Ingraffea, A. R., McGuire, W., Pekoz, T., Gerstle, W., Mettam, K., Wawrzynek, P., Hellier, A., Final Report. Volume 1 of 2. Task IV, Document 86 - 1, AISE/Cornell University Crane Runway Girder Project, June 23, 1986, 47 pp.
  29. Mettam, K., Ingraffea, A. R., Gerstle, W. H., "A Bibliography on Fatigue in Crane Runway Girders," Task I, Report No. 1, in Final Report - Appendices. Volume 2 of 2. Document 86 - 1, AISE/Cornell University Crane Runway Girder Project, June 23, 1986, 22 pp.
  30. Gerstle, W. H., Ingraffea, A. R., "Numerical Modelling of Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders Due to Wheel Loads," Task II, Report No. 1, in Final Report - Appendices. Volume 2 of 2. Document 86 - 1, AISE/Cornell University Crane Runway Girder Project, June 23, 1986, 108 pp.
  31. Ingraffea, A. R., Lin, S. C., "Effects of Elastomeric Rail Pad on Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders," Task II, Report No. 2, in Final Report - Appendices. Volume 2 of 2. Document 86 - 1, AISE/Cornell University Crane Runway Girder Project, June 23, 1986, 46 pp.
  32. Wawrzynek, P., Ingraffea, A. R., "The Effect of Stiffeners on the Forces Transmitted to the Web - to - Flange Junction of Crane Runway Girders," Task II, Report No. 3, in Final Report - Appendices. Volume 2 of 2. Document 86 - 1, AISE/Cornell University Crane Runway Girder Project, June 23, 1986, 49 pp.
  33. Lin, Shan - Wern S., Ingraffea, A. R., "Case Studies of Cracking of Concrete Dams - A Linear Elastic Approach," Department of Structural Engineering Research Report 88 - 2, , School of Civil and Environmental Engineering, Cornell University, January 1988, 116 pp.
  34. Blewitt, J. R., Ingraffea, A. R., O'Rourke, T. D., Stewart, H. E., "Analytical Study of Stresses in Transmission and Distribution Pipelines Beneath Railroads," Topical Report GRI - 87/0234. Gas Research Institute, Chicago, IL, 1987, 156 pp.
  35. Linsbauer, H. N., Ingraffea, A. R., Rossmanith, H. P. and Wawrzynek, P. A., "Simulation of Cracking in the Kolnbrein Arch Dam: A Case Study," Department of Structural Engineering Research Report 88 - 3, School of Civil and Environmental Engineering, Cornell University, June 1988, 62 pp.

36. Grigoriu, M., Saif, M. T. A., El Borgi, S. and Ingraffea, A. R., "Mixed Mode Fracture Initiation and Trajectory Prediction Under Random Stresses," Department of Structural Engineering Research Report 88 – 5.
37. Vossoughi, H., White, R. N. and Ingraffea, A. R. and Sansalone, M., "Fatigue Behavior of Thick Steel Plates Cold - Bent at a Low R/t Ratio," Department of Structural Engineering Research Report 88 - 1, ,School of Civil and Environmental Engineering, Cornell University, February, 1988, 120 pp.
38. Sansalone, M., Ingraffea, A. R. and Soudki, K., "Fatigue Behavior of Steel Plates Bent to a Low R/t Ratio (Phase III)", Department of Structural Engineering Research Report 89 - 7, School of Civil and Environmental Engineering, Cornell University, June 1989, 134 pp.
39. Gray, L. J., Martha, L. F., Ingraffea, A. R., "Hypersingular Integrals in Boundary Element Fracture Analysis," BSC 89/6, IBM Bergen Scientific Center, Bergen, Norway, March, 1989, 23 pp.
40. Boone, T. and Ingraffea, A. R., "Simulation and Visualization of Hydraulic Fracture Propagation in Poroelastic Rock," Department of Structural Engineering Research Report 89 - 6, School of Civil and Environmental Engineering, Cornell University, June, 1989, 430 pp.
41. Martha, L. and Ingraffea, A. R., "Topological and Geometrical Modeling Approach to Numerical Discretization and Arbitrary Fracture Simulation in Three-Dimensions," Department of Structural Engineering Research Report 89 - 9, , School of Civil and Environmental Engineering, Cornell University, August, 1989, 331 pp.
42. Swenson, D. V., Ingraffea, A. R., "The Collapse of the Schoharie Creek Bridge: A Case Study in Concrete Fracture Mechanics", Department of Structural Engineering Research Report 90-4, School of Civil and Environmental Engineering, Cornell University, April, 1990, 39 pp.
43. Ingraffea, A., Grigoriu, M., "A Validation of Predictive Capability", Department of Structural Engineering Research Report 90 - 8, School of Civil and Environmental Engineering, Cornell University, August, 1990.
44. Wawrzynek, Paul A., Ingraffea, A. R., "Discrete Modeling of Crack Propagation: Theoretical Aspects and Implementation Issues in Two and Three Dimensions", Department of Structural Engineering Research Report 91-5, School of Civil and Environmental Engineering, Cornell University, August, 1991, 211 pp.
45. Lutz, E., Ingraffea, A. R., "Numerical Methods for Hypersingular and Near-Singular Boundary Integrals in Fracture Mechanics", Department of Structural Engineering Research Report 91-6, School of Civil and Environmental Engineering, Cornell University, August, 1991, 223 pp.
46. Sousa, J., Ingraffea, A. R., "Three-Dimensional Simulation of Near-Wellbore Phenomena Related to Hydraulic Fracturing from a Perforated Wellbore", Department of Structural Engineering Research Report 92-5, School of Civil and Environmental Engineering, Cornell University, May, 1992, 269 pp.
47. Bittencourt, T., Ingraffea, A. R., "Computer Simulation of Linear and Nonlinear Crack Propagation in Cementitious Materials," Department of Structural Engineering Research Report 93-3, School of Civil and Environmental Engineering, Cornell University, May, 1993, 303 pp.
48. Potyondy, D., Ingraffea, A. R., "A Software Framework for Simulating Curvilinear Crack Growth in Pressurized Thin Shells", Department of Structural Engineering Research Report 93-5, School of Civil and Environmental Engineering, Cornell University, August, 1993, 370pp.
49. P. Wawrzynek, Ingraffea, A., "FRANC2D: A Two-Dimensional Crack Propagation Simulator Version 2.7 User's Guide", NASA Contractor Report 4572, National Aeronautics and Space Administration, Langley Research Center, Hampton, VA, March, 1994, 59 pp.
50. "Fracture Mechanics Life Analytical Methods Verification Testing-Final Report", NAS8-38103, for the George C. Marshall Space Flight Center, NASA, Nichols Research Corporation/Cornell University/ Fracture Analysis Consultants, Inc., 1994.

51. Chi, W-M, Dierlein, G., Ingrassia, A. R., "Finite Element Fracture Mechanics Investigation of Welded Beam-Column Connections", SAC Joint Venture/CUREe Subcontract 26-28, Structural Engineering Report No. 97-7, Cornell University, Ithaca, NY, 167 pp.
52. Chen, C.-S., Wawrzynek, P.A., and Ingrassia, A. R., "Crack Growth Simulation and Residual Strength Prediction in Airplane Fuselages," Final Report for NASA project NAG-1-1184, Structural Engineering Research Report 99-1, School of Civil and Environmental Engineering, Cornell University, January, 1999.
53. Hwang, C., Ingrassia, A. R., Wawrzynek, P., "Virtual Crack Extension Method for Calculating Rates of Energy Release Rate and Numerical Simulation of Crack Growth in Two and Three Dimensions", Structural Engineering Research Report 99-2, School of Civil and Environmental Engineering, Cornell University January, 1999.
54. Hanson, J. H., Ingrassia, A. R., "Proposed Standard Test Method for Round Double Beam Fracture Toughness of Concrete," *Research Report*, 00-1, Department of Structural Engineering, Cornell University, Ithaca, NY, Jan. 2000.
55. Chen, CS, Wawrzynek, PA, and Ingrassia, AR. "Finite Element Stress Analysis Subroutines for RAPID", Final Report to Federal Aviation Administration, Project DTFA0300C00002, 2000.
56. Lewicki, DG, Spievak, L, Wawrzynek, PA, Ingrassia, AR, Handshuh, R, "Consideration of Moving Tooth Load in Gear Crack Propagation Predictions", NASA/TM-2000-210227, ARL-TR-2246, DETC2000/PTG-14386, July, 2000.
57. Iesulauro E, Ingrassia AR. "Computational Micro-Mechanical Investigations of Crack Initiation in Metallic Polycrystals", NASA Langley Research Center, Final Report on Project NAG-1-0205, July 21, 2006, 210 pages.
58. Ingrassia AR, Tuegel E. "Structural Life Forecasting in Extreme Environments", Structural Sciences Center, AFRL/RBSM, Wright Patterson AFB, Dayton, Ohio, October, 2009.
59. Spear AD, Priest AR, Veilleux MG, Hochhalter JD, Ingrassia AR. Surrogate modeling of high-fidelity fracture simulations for real-time residual strength predictions, NASA TM-2011-216879, 2011.

## FUNDED RESEARCH PROJECTS

### Structural Engineering

1. "An Investigation into Mixed - Mode Fracture Propagation in Rock," National Science Foundation Research Initiation Grant ENG78 - 05402, 4/78 - 3/80, \$25,000, Principal Investigator.
2. "Finite Element Analysis of Reinforced Concrete for Cyclic Loading," National Science Foundation Grant PFR - 7900711, 4/79-3/81, \$84,000, Principal Investigator. P. Gergely and R. N. White, Co - Principal Investigators.
3. "Laboratory Testing of the Crack - at - an - Interface Problem," Sandia National Laboratories Contract No. 13 - 5038, 5/79 - 5/80, \$42,000, Principal Investigator.
4. "Three - Dimensional Interactive Computer Graphics in Structural and Geo - Mechanics," National Science Foundation Grant CME79 - 16818, 1/80 - 6/82, \$500,000, Faculty Investigator. J. F. Abel, D. P. Greenberg, W. McGuire, Co-Principal Investigators; F. H. Kulhawy, Faculty Investigator.
5. "Interaction Between Steel and Concrete for Earthquake-Type Loadings," National Science Foundation Grant CME80 - 20925, 4/1/81 - 9/30/83, \$140,000, Principal Investigator. P. Gergely, Co - Principal Investigator.
6. "Interactive Color Display of Three - Dimensional Engineering Analysis Results," National Aeronautics and Space Administration, Grant NAG3 - 395, 3/1/83 - 2/28/87, \$133,285, Associate Investigator. J. F. Abel, Principal Investigator.
7. "Welded Crane Runway Girder Study," Association of Iron and Steel Engineers, 8/83 - 8/85, \$234,348, Principal Investigator. W. McGuire, T. Pekoz, Co - Principal Investigators.
8. Presidential Young Investigator Award in Structural Mechanics, National Science Foundation Grant 8351914, 6/84 - 6/89, \$500,000, Principal Investigator.
9. "Fatigue Behavior of Thick Steel Plates," Electric Boat Division/General Dynamics, PO# R2041 - 907, 1/86 - 12/88, \$233,218, Co - Principal Investigator. R. N. White, Principal Investigator.
10. "Probabilistic Fracture Mechanics," AFOSR, 4/87 - 4/90, \$269,624, Co - Principal Investigator. M. Grigoriu, Co - Principal Investigator.
11. "CISE Research Instrumentation: Computer Graphics Dynamic Simulation for Scientific Inquiry," National Science Foundation Grant CCR - 8717024, 4/1/88 - 9/30/89, \$145,600, Co - Principal Investigator. M. Cohen, D. Greenberg, and J. Abel, Co - Principal Investigators.
12. "Visualization for Supercomputing: A Graphics Workstation Approach," National Science Foundation, Grant ASC - 8715478, 8/1/88 - 1/31/90, \$202,532, Co - Principal Investigator. D. Greenberg, Principal Investigator. J. Abel, M. Cohen, D. Caughey, Co - Principal Investigators.
13. "Advanced Computational Fracture Mechanics," Digital Equipment Corporation, 7/89 - 7/90, \$100,000, Principal Investigator.
14. "Fatigue and Damage Tolerance", Northrop-Grumman Corporation, 6/89-12/00, \$249,000, Principal Investigator.
15. "Research in Fracture Mechanics", Exxon Education Foundation, 9/89-9/92, \$30,000, Principal Investigator.
16. "Crack Growth Prediction Methodology for Multi-Site Damage", NASA Langley Research Center, 9/90-9/98, \$926,147, Principal Investigator.
17. "Fracture Mechanics Life Analytical Methods Verification Testing", Nichols Research Corp. /NASA MSFC, 8/91 - 8/94, \$183,860, Principal Investigator.

18. "Mode I/III Fatigue Crack Growth Measurements in 2024 Aluminum Sheet", NASA Langley Research Center, 6/91-9/93, \$159,836, Co-Principal Investigator. A. Zehnder, Co-Principal Investigator.
19. "A Study of Failure Mechanisms of Advanced Flex Cables", IBM Corporation, 1/20/92-1/19/93, \$25,000, Co-Principal Investigator. A. Zehnder, Co-Principal Investigator.
20. "Detecting Cracks in Concrete Dams", U. S. Army Engineer Waterways Experiment Station, 4/1/94-1/1/95, \$39,339, Co-Principal Investigator. M. Sansalone, Principal Investigator.
21. "Measurement of Fracture Toughness of Concrete Using the Short-Rod Procedure", NSF CMS 9414243, 9/95-8/98, \$203,854. Principal Investigator.
22. "Simulation of Damage Tolerance in Honeycomb Core Structure", Boeing Commercial Airplane Co., 5/96-12/98, \$204,000. Principal Investigator.
23. "Simulation of Crack Growth in Spiral Bevel Gears", NASA Glenn Research Center, 12/96-12/00, \$289,961. Principal Investigator.
24. "Fracture of Steel Joints", CUREe SAC Phase II Subcontract No. 28, 9/96-12/96, \$23,000. Co-Principal Investigator. Prof. G. Deierlein, Principal Investigator.
25. "Multidisciplinary Center for Earthquake Engineering Research", NSF, 10/97-9/02, \$1,500,000. Associate Investigator. Prof. R. White, Co-Principal Investigator; Profs. G. Deierlein, M. Grigoriu, Associate Investigators.
26. "Simulation of Crack Propagation on Teraflop Computers", NSF, 1/98-12/00, \$1,800,000. Co-Principal Investigator. Profs. S. Vavasis and K. Pingali, Co-Principal Investigators.
27. "Probabilistic Simulation of Fatigue Crack Initiation", AFOSR, 3/98-2/01, \$600,000. Principal Investigator. Profs. M. Grigoriu, M. Miller, P. Dawson, Co-Principal Investigators.
28. "Development and Implementation of T-Stress Criterion", NASA Langley Research Center, 8/97-3/98, \$20,128. Principal Investigator.
29. "Crack Turning and Arrest Mechanisms for Integral Structures", NASA Langley Research Center, 1/98-6/00, \$103,642. Principal Investigator.
30. "Basic Research in Crack Growth Prediction Methodologies", NASA Langley Research Center, 1/98-11/99, \$185,000. Principal Investigator.
31. "Fatigue Crack Growth in Aluminum Alloys", Alcoa Foundation, 6/97-5/98, \$10,000. Principal Investigator.
32. "Multiscale Modeling of Defects in Solids", NSF 9873214, 10/98-9/01, \$1,500,000. Co-Principal Investigator. Profs. P. Dawson, and J. Sethna Co-Principal Investigators, C. Myers, Co-Principal Investigator.
33. "A Two-Tier Computation and Visualization Facility for Multiscale Problems", NSF 9972853, 10/99-9/04, \$1,500,000. Co-Principal Investigator. Profs. K. Pingali, N. Chrisochoides, C. Cruz-Neira, Guang Gao, Co-Principal Investigators.
34. "Finite Element Stress Analysis Subroutines for RAPID", Federal Aviation Administration, 9/99-4/2000, \$34,438. Principal Investigator.
35. "Finite Element/Fracture Mechanics Simulation of Trajectories During Slitting of Plastic Films", Eastman Kodak Company, 1/1/99-12/31/01, \$110,000. Principal Investigator.
36. "ITR: Adaptive Software for Field-driven Simulations", NSF 0085969, 9/1/00-8/31/04, \$5,000,000. Co-Principal Investigator. Prof. K. Pingali, PI, B. K. Soni, J. F. Thompson S. A. Vavasis, Co-PIs.

37. "Developing Technologies for Modeling Damage in Stiffened Thin Shell Structures", NASA LaRC, 11/1/01-10/31/04, \$160,107. Principal Investigator.
38. "Computational Micro-Mechanical Investigations of Crack Initiation in Metallic Polycrystals", NASA LaRC, 2/1/02-1/31/05, \$230,182. Principal Investigator.
39. "The Institute for Future Space Transport", NASA Marshall RC University Research, Engineering and Technology Institute, 8/1/02-9/15/07, \$15,616,120, Co-Principal Investigator. W. Shyy, Principal Investigator, B. Soni, B. Davidson, J. Olds, Co-Principal Investigators.
40. "Structural Integrity Prognosis System-SIPS", DARPA, 10/1/03-8/31/08, \$1,288,400, Cornell Principal Investigator. J. Madsen, Northrop Grumman Corp. Project Manager.
41. "Fracture Mechanics Analysis of MANPADS-Damaged Aircraft Structures", NASA LaRC, 5/05-9/06, \$74,000. Principal Investigator.
42. "Advanced Digital Material Machine (ADMM) "AFOSR/DURIP, 2006, \$300,000. Principal Investigator.
43. "Multi-Scale Simulation of Cracking Processes in Metallic Materials", NASA LaRC, NNX07AB69A, 1/07-12/10, \$392,526. Principal Investigator.
44. "Constellation University Institute Project: Computational Simulation of Damage Tolerance for Composite and Metallic Structures", NASA, 10/1/07-9/30/10, \$450,000, Principal Investigator.
45. "Multi-scale Simulation of Fatigue Damage", Northrop Grumman Corporation, 1/1/07-12/31/09, \$55,000, Principal Investigator.
46. "Computational Methods in Physics-Based Modeling of Damaged Flight Structures", NASA LaRC NNX08AC50A, 1/1/08-12/31/2010, \$299,972, Principal Investigator.
47. "Collaboration between Cornell Fracture Group and Exponent, Inc.", Exponent Inc., 3/08-12/08, \$29,204, Principal Investigator.
48. "Geometrical Simulation of Complete Process of Microstructurally Small Fatigue Cracking" E DARPA, HR0011-09-1-0002, 1/09-12/09, \$150,000, Principal Investigator.
49. "Parallel File Serving R&D", IBM, \$20,200, 7/09-6/10, Principal Investigator.
50. "Prognosis of Long-Term Load-Bearing Capability in Aerospace Structures: Quantification of Microstructurally Short Crack Growth", Air Force Office of Scientific Research, \$750,000, 5/10/5/13, Co-Principal Investigator.

### **Geotechnical Engineering**

1. "TBM Performance Study," U.S. Dept. of Transportation, 3/80 - 3/82, \$164,000, Associate Investigator. T. D. O'Rourke, Principal Investigator; F. H. Kulhawy, Associate Investigator.
2. "A Study of Cast Iron Gas Main Replacement," New York Gas Group, 8/81 - 12/83, \$287,000, Associate Investigator. T. D. O'Rourke, Principal Investigator; F. H. Kulhawy, Associate Investigator.
3. "Uplift/Compression Transmission Line Structure Foundation Research," Electric Power Research Institute, RP1493 - 4, 1984 - 1988, \$2,450,000, Associate Investigator. F. H. Kulhawy, Principal Investigator; T. D. O'Rourke, M. Grigoriu, Associate Investigators.
4. "Numerical Investigations into Crack Propagation in Rock," National Science Foundation Grant CEE - 8316730, 6/1/84 - 5/30/86, \$150,000. Principal Investigator

5. "Workshop on Interactive Computer Modeling and Graphics for the Design and Optimization of Field and Laboratory Experiments in Geotechnical Engineering." National Science Foundation Grant CEE 8413471, 12/84 - 11/86, \$39,681. Principal Investigator.
6. "Evaluation of Cased and Uncased Gas Distribution and Transmission Piping Under Railroads and Highways, Gas Research Institute, 11/86 - 1/94, \$ 3,602,035. Co-Principal Investigator. T. D. O'Rourke and H. Stewart, Co-Principal Investigators.
7. "Influence of Perforations Upon Subsequent Hydraulic Fracturing," Digital Equipment Corp. and Dowell Schlumberger, 1/88 - 12/96, \$448,000. Principal Investigator.
8. "Computational Simulation of Hydrofracturing", NSF CISE Postdoctoral Associate Award for Dr. K. Shah. 11/95-10/97, \$46,200. Principal Investigator.
9. "3D Crack Initiation and Propagation in Transparent Rock Like Materials Loaded in Compression", NSF, 9/96-8/99, \$148,000. Principal Investigator.

### **Engineering Education**

1. "Study of Complementary Research and Teaching in Engineering Science - PROJECT SOCRATES," U. S. Department of Education, Fund for the Improvement of Post - Secondary Education, G 008642170, 9/15/86 - 9/14/89, \$236,496, Project Director.
2. "Workstations For Instructional Computing in the College of Engineering," Digital Equipment Corporation, 5/1/88 - 4/31/90, \$664,000. Project Director.
3. "Workstations for Project SOCRATES," Apollo Computer, Inc., June, 1989, \$87,105. Project Director.
4. "Workstations for Project SOCRATES", Sun Microsystems, Inc., June, 1990, \$89,415. Project Director.
5. "Synthesis National Engineering Education Coalition", National Science Foundation, 9/30/90 - 9/30/94, \$12,278,036. Project Director.
6. "1992 Summer Institute for Computer Graphics", New York State Education Department, \$56,000, 7/19/92-8/8/92, Project Co-Director. C. Mink, Director.
7. "Support for Educational Computing Equipment", Hewlett Packard, 6/92, \$427,318. Project Director.
8. "Synthesis Coalition/GE Foundation Faculty Exchange Award", GE Foundation, Spring 1994 - Spring 1997, \$230,000, Principal Investigator.
9. "Synthesis Coalition/Raytheon Company Student Award" Raytheon Company, 1994-1995, \$24,000, Principal Investigator.
10. "Application and Infrastructure Linkage to Altoona Area School District and Manhattan Center for Science and Math High School", Synthesis Coalition/NSF/GE Foundation/Mr. A. Misciagna, 10/1/94-9/30/96, \$284,000, Project Director.
11. "Integration of Information Age Networking and Parallel Supercomputer Simulations into University and General Science K-12 Curricula", NSF, 1/96-12/98, \$102,000, Co-Principal Investigator. J. Sethna, Co-Principal Investigator.
12. REU Supplement to "Measurement of Fracture Toughness of Concrete Using the Short-Rod Procedure", NSF, 9/95-9/98, \$10,000, Principal Investigator.
13. REU Supplements to "Integration of Information Age Networking and Parallel Supercomputer Simulations into University and General Science K-12 Curricula", NSF, 9/96-9/98, \$20,000, Co-Principal Investigator with Prof. James Sethna, Physics.

14. "Tech City Exhibition", NSF, 7/98-6/01, \$639,543, Co-Principal Investigator. Dr. C. Trautmann, Principal Investigator.
15. "An Advanced Interactive Discovery Environment for Engineering Education" NASA/New York State/AT&T, 2/1/01-12/31/07, \$4,300,000, Co-Principal Investigator. Prof. B. Davidson, Principal Investigator, Prof. E. Liddy, Co-PI.
16. "An IGERT Training Program In Sustainable Energy Recovery From The Earth-Education At The Intersection Of Geosciences And Engineering". July 2010-June 2015, National Science Foundation, \$1,137,047. Co-Principal Investigator. Prof. Jeff Tester, Principal Investigator, Profs. Terry Jordan, Paulette Clancy, Co-PI's.

### **Co-operative Research**

1. "Co-operative Agreement between Cornell University and the Technical University of Delft", National Science Foundation Grant PFR-8020924, 1/81 - 12/82, \$25,800, Co - Principal Investigator. P. Gergely, Principal Investigator; R. N. White, Co - Principal Investigator.
2. "Scientific Visit to Plan Co-operative Research in Hydraulic Fracturing," Catholic University of Rio de Janeiro/Cornell University, National Science Foundation Grant INT - 8814466, July 1988, \$2,336, Principal Investigator.
3. "Fracture Mechanics Case Studies of Concrete Dams" Technical University of Vienna, Austria/Cornell University, National Science Foundation Grant INT-8814457, 2/89 - 2/92, \$8,080, Principal Investigator.
4. International Supplement to National Science Foundation Grant "ITR: Adaptive Software for Field-driven Simulations", to collaborate with Czech Technical University, Z. Bittnar, Czech Co-PI, 7/99-8/03, \$24,375, Co-Principal Investigator.

## THESES DIRECTED

### Master of Science

1. "A Fracture Mechanics Analysis of the Fontana Dam," John Chappell, May, 1981.
2. "Mixed-Mode Crack Propagation in Mortar and Concrete." Manrique Arrea, January 1982.
3. "The Fracture Mechanics of Bond in Reinforced Concrete," Walter Gerstle. May 1982.
4. "Concrete Fracture: A Linear Elastic Fracture Mechanics Approach," David Catalano, August, 1982.
5. "Interactive and Graphic Two - Dimensional Fatigue Crack Propagation Analysis Using Boundary Element Method," Kodwo Otsei;du, January, 1983.
6. "An Experimental Investigation of Fatigue Cracking in Welded Crane Runway Girders Due to Wheel Induced Stresses," Kirk I. Mettam, January, 1986.
7. "An Investigation of the Failure Process of the STEM - PMMA Interface in Cemented Prostheses," Leonard Daniel - Timmie Topoleski, June 1986.
8. "Interactive Finite Element Analysis of Fracture Processes: An Integrated Approach," Paul A. Wawrzynek, May 1987.
9. "Analytical Study of Stresses in Transmission and Distribution Pipelines Beneath Railroads," J. Russell Blewitt, May 1987.
10. "Case Studies of Cracking of Concrete Dams--A Linear Elastic Approach," Shan - Wern Steve Lin, January 1988.
11. "Fracture Analysis Code: A Computer - Aided Teaching Tool," Maya Srinivasan, January 1988.
12. "Two-Dimensional Numerical Evaluation of Near Wellbore Phenomena: Perforation Performance & Interacting Hydraulic Fractures", Stephen James Lamkin, May 1990.
13. "On Finite Element Analysis of Face Sheet Cracking in Honeycomb Core Sandwich Panels", Kenneth Ferguson, January 1999.
14. "Simulating Fatigue Crack Growth in Spiral Bevel Gears", Lisa Eron Spievak, August 1999.
15. "Cracking Dams: An Interactive Web Site for K12", Megann V. Polaha, August 1999.
16. "Experimental Investigations into Damage Tolerance of Honeycomb Sandwich Panels", Ani Ural, August, 1999.
17. "Simulations of Crack Initiation in Aluminum Alloys with Inclusions", Ketan Dodhia, January, 2002.
18. "Decohesion of Grain Boundaries in Statistical Representations of Aluminum Polycrystals", Erin Iesulauro, January, 2002.
19. "An Evaluation of Surface Cracks in Welded Components of Nuclear Reactor Vessels", John Emery, May, 2003.
20. "Microstructural Reconstruction and Three-Dimensional Mesh Generation for Polycrystalline 7075-T651 Aluminum Alloy", Michael Veilleux, May, 2007.
21. "A Two-Dimensional Multiscale Method for Fatigue Crack Nucleation in Polycrystalline Aluminum Alloys ", Jeffrey Bozek, May, 2007.

**Doctor of Philosophy**

1. "Three-Dimensional Finite Element Analysis of Cyclic Fatigue Crack Growth of Multiple Surface Flaws." Corneliu Manu, June, 1980. Professor (Retired) University of Toronto.
2. "Automatic Two-Dimensional Quasi-Static and Fatigue Crack Propagation Using the Boundary Element Method." George E. Blandford, January, 1981. Professor, University of Kentucky.
3. "Interactive Finite Element Analysis of Reinforced Concrete: A Fracture Mechanics Approach," Victor E. Saouma, January, 1981. Professor, University of Colorado/Boulder.
4. "An Integrated Boundary Element Analysis System with Interactive Computer Graphics for Three - Dimensional Linear Elastic Fracture Mechanics," Renato S. Perucchio, January, 1984. Professor, University of Rochester.
5. "Finite and Boundary Element Modelling of Crack Propagation in Two- and Three - Dimensions Using Interactive Computer Graphics," Walter H. Gerstle, January, 1986. Professor, University of New Mexico.
6. "Modeling Mixed - Mode Dynamic Crack Propagation Using Finite Elements," Daniel V. Swenson, January 1986. Professor, Kansas State University.
7. "Simulation of Crack Propagation in Poroelastic Rock with Application to Hydrofracturing and *In - Situ* Stress Measurement," Thomas J. Boone, January, 1989. VP of Research, EXXON.
8. "Topological and Geometrical Modeling Approach to Numerical Discretization and Arbitrary Fracture Simulation in Three-Dimensions," Luiz Martha, August, 1989. Professor, Catholic University of Rio de Janeiro, Brazil.
9. "Numerical Methods for Hypersingular and Near-Singular Boundary Integrals in Fracture Mechanics", Earlin Lutz, May, 1991. Senior Research Engineer, Bentley, Inc.
10. "Discrete Modelling of Crack Propagation: Theoretical Aspects and Implementation Issues in Two and Three Dimensions", Paul A. Wawrzynek, August, 1991. Chief Engineer, Fracture Analysis Consultants, Inc.
11. "Three-Dimensional Simulation of Near-Wellbore Phenomena Related to Hydraulic Fracturing from a Perforated Wellbore", José Sousa, May, 1992. Professor, University of Campinas, Brazil.
12. "Computer Simulation of Linear and Nonlinear Crack Propagation in Cementitious Materials", Tulio Bittencourt, May, 1993. Professor, University of Sao Paulo, Brazil.
13. "A Methodology for Simulation of Curvilinear Crack Growth in Pressurized Shells", David Potyondy, August, 1993. Senior Research Engineer, Itasca, Inc.
14. "Experimental Validation Testing of Numerical Prediction Techniques for Three-Dimensional Fracture and Fatigue", William Riddell, June, 1995. Assoc. Professor, Rowan University.
15. "Crack Growth Simulation and Residual Strength Prediction in Thin Shell Structures", Chuin-Shan Chen, January, 1999. Assoc. Prof., National Taiwan University.
16. "Virtual Crack Extension Method for Calculating Rates of Energy Release Rate and Numerical Simulation of Crack Growth in Two and Three Dimensions", Changyu Hwang, January, 1999. Professor, Seoul University of Venture and Information.
17. "Crack Turning in Integrally Stiffened Aircraft Structures", Richard Pettit, August, 2000. Chief Engineer, FractureLab, LLC.
18. "An Experimental-Computational Evaluation of the Accuracy of Fracture Toughness Tests on Concrete", James Hanson, August, 2000. Assoc. Prof., Rose-Hulman Institute of Technology.

19. "Interface Modeling of Composite Material Degradation", Tong-Seok Han, May, 2001 (with Prof. Sarah Billington). Research Engineer, Korea Electric Power Research Institute.
20. "Modeling and Simulation of Fatigue Crack Growth in Metals Using LEFM and a Damage-Based Cohesive Model", Ani Ural, May, 2004 (with Prof. Katerina Papoulia). Assistant Professor, Villanova University.
21. "Decohesion of Grain Boundaries in Statistical Representations of Aluminum Polycrystals", Erin Iesulauro, May, 2006. Staff Engineer, Los Alamos National Laboratory.
22. "A Hierarchical, Probabilistic, Damage and Durability Simulation Methodology", John Emery, May, 2007, Staff Engineer, Sandia National Laboratory.
23. "Finite Element Simulation of Fatigue Crack Stages in AA 7075-T651 Microstructure", Jacob Hochhalter, May, 2010, Staff Engineer, NASA Langley Research Center.
24. "Geometrically explicit finite element modeling of AA7075-T651 microstructure with fatigue cracks", Michael Veilleux, August, 2010, Senior Member of Technical Staff, Sandia Livermore National Laboratory.
25. "Microstructural Simulation of Fracture Processes in Cortical Bone", Erin Oneida, December, 2013 (expected).
26. "Residual Strength of Damaged Aerostructures", Ashley Spear, NSF Graduate Fellow, May, 2013 (expected).
27. "DDSim for Composite Structures", Brett Davis, May, 2013 (expected).
28. "Geometrical Simulation of Complete Process of Microstructurally Small Fatigue Cracking ", Albert Cerrone, December 2013 (expected).