

# THE (PETRI) DISH

*Faculty of Science Newsletter*



Dr. Heather Reader, Chemistry, took part in Science Meets Parliament in May, two days of meetings between parliamentarians and other Canadian Research Chairs from across the country.

## In the News

Dr. Murray Colbo, formerly of Biology, lends his expertise to this story on reactions to mosquito and black fly bites. [Saltwire](#)

Retired Earth Sciences professor, Dr. Derek Wilton on the new Atlantic Canadian mining exploration boom. [CIM Magazine](#)

Psychology grad students in limbo while Eastern Health residency program on hold. [CBC](#)

The province's cormorant cull is now open but Dr. Bill Montevecchi, Psychology, says there are better ways of controlling the population. [CBC](#)

Dr. Fran Kerton, Chemistry, has been reducing her consumption of single-use plastics ahead of Canada's recently announced ban. [Global News](#)

Dr. Frédéric Cyr, an adjunct with Physics & Physical Oceanography, has penned an article about how Iceberg Alley got its name and why it may be under threat. [The Conversation](#)

Women and immigrants, such as Dr. Nikitha Kendyla, Biochemistry, who co-founded Nucliq Biologics with her partner and husband, Dr. Purvikalyan Pallegar, Biology, are poised to lead Newfoundland and Labrador's tech industry. [Globe & Mail](#)

Memorial University is launching two new research projects in partnership with IBM. [Saltwire](#), [NTV](#) and [VOCM](#)

Dr. Shawn Leroux, Biology is closely monitoring the impacts of climate change on local species. [LaPresse](#)

Dr. Mark Hebert, Psychology, is in the news for his work to locate and address monster potholes. [Saltwire](#)



## DEAN'S MESSAGE

I hope everyone had a Happy Canada Day earlier this month. In Newfoundland and Labrador we also celebrate Memorial Day to remember the sacrifices made by the soldiers of the 1st Newfoundland Regiment in the First World War at Beaumont-Hamel. July also marks the beginning of the heavy holiday season and I hope everyone finds some time for some much-earned rest and relaxation. The last few months have been very busy as you can see by the highlights in this issue of the Petri Dish.

June was National Indigenous History Month, a time to recognize and learn about the history of Indigenous Peoples across Canada. I found an interesting [school video project](#) done by a young man from the Oneida Nation of Thames highlighting a few of the many Indigenous soldiers from Ontario who fought in the First World War.

June was also Pride month. People may have noticed the pride posters around the Faculty of Science reminding us that everyone, including our LGBTQIP2SAA friends, are welcome here. I quote my high school friend, Xavier: "During Pride season it's important for straight allies to attend pride events – especially the small ones [in small towns]. It's important for the kid next door who sees their neighbour and knows they have someone they can talk to if they can't talk to their parents...being visible to scared or closeted individuals would be a HUGE deal for them and could help in their journey of self love and acceptance knowing they had a friend, neighbour, educator, physician, mechanic, electrician, farmer, plumber or clergy to speak to in times of self doubt or personal crisis."

While these posters were put up in June by each department, they will remain year-round. I also urge you to read the Gazette interview with Dr. David Pike who in June became the first known openly gay president of the Canadian Mathematical Society.



Dr. Carole Peterson, Psychology, is pictured with Prime Minister Justin Trudeau, Premier Andrew Furey and staff from Memorial's Child Care Centre.

## FACULTY NEWS

Dr. Yolanda Wiersma, Biology has been named to the Government of Nova Scotia's Forest Biodiversity Science Advisory Committee. [Read](#)

The School of Graduate Studies Supervisor Award was presented to Dr. Joshua Rash, Psychology; and Dr. Fereidoon Shahidi, Biochemistry, for their mentorship and and passion for student success.

Dr. Sherri Christian, Biochemistry, made a presentation on her cancer research at the CIHR Institute of Cancer Research stakeholder engagement event on June 16.

Math & Stats held the Calculus Placement Test in person for the first time since the start of the pandemic. The test was given to approximately 400 students on June 11 at various sites around the province.

Dr. Stephen Piercey, Earth Sciences, is part of a team receiving more than \$1 million from NSERC Alliance-Mitacs to define a chemical and temporal 'fingerprint' for volcanic rocks in the Golden Triangle of northwest British Columbia. [Read](#)

## Alumni News

Dalainey Drakes, Psychology, has been elected the new Student Affiliate Representative on the Canadian Association of Cognitive and Behavioural Therapies Board of Directors.

Space and science communicator, Bethany Downer, Geography, writes a letter to Memorial's Class of 2022. [Saltwire](#)

Kaushalya Rathnayake, Biology, talks about his love for biology, his challenges as a foreign student and his vision for Sri Lanka. [The Morning](#)

Joshua Bailey, Earth Sciences, is the new head of commercial, metals exploration for BHP, one of the world's largest mining companies.

## In the News (con't)

Memorial's Core Science Facility emulates natural elements, local traditions. [Building Design and Construction](#)

Earth Sciences professor and director of the Bonne Bay Marine Station, Dr. Duncan McIlroy, and Ocean Sciences graduate student, Mary Clinton answer questions about ocean science. [CBC Cross Talk](#).

Dr. Steve Carr, Biology, was interviewed by APTN on his Mi'kmaq / Beothuk research. (Starts at 3:50 mark) [APTN](#)

## In the Gazette

Memorial receives funding for new Centre for Artificial Intelligence. [Read](#)

Doctor of psychology program feeling impacts of cancelled residency program. [Read](#)

Dr. David Pike becomes first openly gay president of the Canadian Math Society. [Read](#)

Provincial teams win at world remotely operated vehicle championship. [Read](#)

Memorial graduate students create programming for entire northern school. [Read](#)

Nearly \$8 million invested to accelerate diverse research discoveries. [Read](#)

Getting students to think about underrepresented scientists and cultural contributions to science. [Read](#)

Biology students rank high in international medical case competition. [Read](#)

Ocean Sciences receives donation for new graduates award. [Read](#)

New unit offers clinical, social and health psychology research opportunities. [Read](#)

More than \$18-million industry and government investment strengthens Memorial's computational infrastructure. [Read](#)

Memorial's global leadership for ocean research, teaching and learning and public engagement scores big results. [Read](#)

Whale of a day a memorable, highly attended community event. [Read](#)

Award-winning Ocean Sciences professor inspired to be a better teacher. [Read](#)

## Program Completion

Xi Xue, PhD, Marine Biology

## NEW FACULTY

Dr. Kate Wilson, Biochemistry  
Dr. Steven Denyszyn, Earth Sciences  
Dr. Nan Zheng, Math & Stats  
Dr. Noah Fleming, Computer Science  
Dr. Murray Wilson, Physics & Physical Oceanography

## NEW STAFF

Deborah Hartery, Math & Stats  
Cherie Hussey, Dean of Science Office  
Chris Davis, Computer Science  
Zachary Smith, Ocean Sciences

## RETIREMENTS

Gail Kenny, Dean of Science Office  
Barry Walters, Biochemistry

# STUDENT NEWS

**Justine Yick**, Psychology, won an Undergraduate Research Award and an Engagement Prize at Science Atlantic's Psychology Conference.

**Francine Burke**, Psychology, was awarded a Canadian Institutes of Health Research Institute for Gender and Health Sex and Gender in Health Research Trainee Network poster award. She also received the Women's Health Research Cluster Conference Award.

**Grace Mercer**, Chemistry, 1st place physical chemistry presentation (poster), Science Atlantic ChemCon 2022.

**Reza Moshrefi**, Chemistry, best graduate presentation (oral), Science Atlantic ChemCon 2022.

**Dennis Sánchez-Mora**, Earth Sciences, 2021 best paper award, *Canadian Journal of Earth Sciences*.

**Noah Pevie**, Psychology, has received an NL Support Education Funding Competition Award.

**Bridget Barry**, Psychology, received an NL Support Undergraduate Training in Research Award.

**Chad Synyard**, Psychology, has received the Tore Grude Memorial Scholarship towards his future studies this fall at the University of New Brunswick.

**Kera McGrath**, Psychology, is incoming vice president of the Newfoundland and Labrador chapter of the Canadian Celiac Association.

**Saxon Althorp**, Marine Biology, has received the Bob Hooper Scholarship.

**Cerren Richards**, Ocean Sciences, is the recipient of the Dr. Leslie Tuck Avian Ecology Award, the Commander Peter G. Chance Scholarship and the National Scholarship in Ocean Studies at Memorial University of Newfoundland.

**Emily Rowe**, Psychology, has won an NL Support Education Funding Competition Award.

**Chris Galley**, Earth Sciences, has co-won the 'Integration' prize at the Prospectors and Developers Association of Canada Frank Arnott Next Generation Explorers Award finals as part of Team Create.



Memorial's Whale of a Day event brought more than 1,500 visitors to the Core Science Facility in May.



Ministers Bernard Davis, Environment & Climate Change, and Minister Derrick Bragg, Fisheries, Forestry and Agriculture, visited the Ocean Sciences Centre.



Mathematics & Statistics hosted the 2022 Canadian Mathematical Society Summer Meeting from June 3-6. At the event, Dr. **David Pike**, Math & Stats, began his mandate as the newest society president.

(L-R) Dr. **Termeh Kousha**, executive director; Dr. **Javad Mashreghi**, outgoing president; Dr. **Pike**, and Dr. **J.C. Lored-Osti**, Math & Stats department head.



**Mahumm Ghaffar** and **Reefat**, Theoretical Physics; and **Jonathan Barrett**, Physics, Grenfell campus; attended the Canadian Association of Physicists Congress. Left to right: **Nigel Smith**, Director of TRIUMF; **Art McDonald**, 2015 Nobel Laureate in Physics; **Jonathan** and **Mahumm**. [Read](#)

# STUDENT NEWS (CONT'D)

## Science Scholarships 2021

**Victoria White**, Chemistry - General Rick Hillier Scholarship in Science and Leadership

**Sydney Sullivan**, Marine Biology - LGL Limited Scholarship in Marine Science

**Cameron Tobin**, Biology - Lee Wulff Scholarship

**Amelia Jones**, Biology/Psychology - Restoration of Labrador Exploration Sites Inc. (ROLES) Science Bursary

**Willow Squires**, Biochemistry - Faculty of Science Opportunity Fund Scholarship

**Kathryn Cole**, Biology - Stantec Scholarship

**Darren Li Chong Youne Li Shing Hiung**, Ocean Sciences - Sun Life Financial Scholarship in Applications of Technology

**Claire Langille**, Biochemistry; **Mahek Parmar**, Computer Science; and **Ayon Debnath**, Computer Science - Churchill Falls (Labrador) Corporation, Limited Science Scholarship

**Brianna Hepditch**, Psychology - Bruce Parly Family Scholarship

**Rylan Croke**, Chemistry - Dr. Wallace Rendell Scholarship

**Abby Pace**, Biochemistry - Williams Science Scholarship

**Brooke Hiscock**, Psychology - William Kenneth MacLeod Scholarship

**Ahida Sharier**, Psychology/Biochemistry - Julius and Bella Lekovitz Memorial Scholarship

## Fellow of the School of Graduate Studies

**Shivam Arora**, Mathematics & Statistics

**Mohammed Asfour**, Computer Science

**Kam To Billy Chan**, Physics & Physical Oceanography

**Samantha Dilday**, Environmental Science

**Dalainey Drakes**, Psychology

**Michael Dunham**, Earth Sciences

**Laura Fallon**, Psychology

**Katherine Flores**, Environmental Science

**Christian Gaviria-Salazar**, Environmental Science

**Marilena Geng**, Physics & Physical Oceanography

**Travis Heckford**, Biology

**Xin Huang**, Computer Science

**Ligia Elena Jaimes Osorio**, Earth Sciences

**Sara Jobson**, Marine Biology

**Tomer Katan**, Marine Biology

**Celyn Khoo**, Environmental Science

**Ba Thuong Le**, Environmental Science

**Shuaishuai Li**, Computer Science

**Yubin Li**, Computer Science

**Tao Liu**, Computer Science

**Chelsea Malayny**, Environmental Science

**Marta Miatta**, Marine Biology

**Dewan Mushfiq**, Computer Science

**Jenna Neville**, Earth Sciences

**Jacob Newman**, Earth Sciences

**Kyle Nickerson**, Computer Science

**Han Peng**, Biochemistry

**Nishant Rathore**, Computer Science

**Jennifer Rey-Goyeneche**, Environmental Science

**Ali Saheb Alfosool**, Computer Science

**Umanath Sharma**, Biology

**Nicole Smith**, Marine Biology

**Mohammad Sorkhian Khoozani**, Computer Science

**Lauren Squires**, Psychology

**Zhanae Sutherland**, Environmental Science

**Shuo Wang**, Computer Science

**Yue Xing**, Computer Science

**Pei Yang**, Earth Sciences



Earth Sciences students supervised by Dr. **John Jamieson** have recently returned from research expeditions.

**Caroline Gini** (top) spent six weeks on a French research vessel in the Atlantic Ocean. **Sarah Moriarty** (right) spent nine weeks on a German research vessel crossing the southern Pacific from Chile to New Caledonia. **Johannes Scheffler** (bottom) spent three weeks on an American research vessel in the North Pacific.



The Eastern Edge Robotics team has placed third overall in the 2022 MATE ROV World Championship - Explorer Class. The team is comprised of students from Science, Engineering and the Marine Institute.

# FUNDING ANNOUNCEMENTS

## Discovery Grants

- Dr. **Carole Peterson**, Psychology, Childhood amnesia and early memories in children and adults, \$235,000
- Dr. **Iain McGaw**, Ocean Sciences, Using more natural acclimation regimes to study the physiological responses of decapod crustaceans to environmental perturbations, \$195,000
- Dr. **Kurt Gamperl**, Ocean Sciences, Advancing Our Understanding of How Cardiovascular Control, Function and Plasticity Influence Fish Performance and Ecophysiology, \$390,000
- Dr. **Shyamchand Mayengbam**, Biochemistry, Investigating novel roles of B-vitamins in gut-host interactions, \$130,000
- Dr. **Yuming Zhao**, Chemistry, Development of New Organic Electronic and Optoelectronic Materials, \$145,000
- Dr. **Michael Katz**, Chemistry, Exploring secondary interactions in Metal-Organic Frameworks, \$240,000
- Dr. **Christina Bottaro**, Chemistry, Advancing Design and Application of Porous Polymeric Sorptive Phases for Direct Introduction Mass Spectrometry, \$145,000
- Dr. **Erika Merschrod**, Chemistry, Composite nanomaterials: small-scale control and mapping, large impact on science and society, \$145,000
- Dr. **Terrence Tricco**, Computer Science, Computational Fluid Dynamics in the Exascale Era of Computation, \$125,000
- Dr. **Amilcar Soares**, Computer Science, Using data augmentation, active learning, and visual analytics for learning with limited examples on mobility data sets, \$125,000
- Dr. **Qiang Ye**, Computer Science, Intelligent Networking and Computing for Next-Generation Wireless Applications, \$130,000
- Dr. **Paul Snelgrove**, Ocean Sciences, Sustaining Biodiversity and Functioning in a Changing Ocean, \$200,000
- Dr. **Julissa Roncal**, Biology, Role of palaeogeographical and ecological factors on the evolution and assembly of plant communities, \$200,000
- Dr. **David Wilson**, Psychology, The ecology and evolution of amplitude in animal acoustic communication systems, \$200,000
- Dr. **Craig Purchase**, Biology, Natural and sexual selection linkages across the biphasic life cycle: experimental insight from fish, \$140,000
- Dr. **Eric Vander Wal**, Biology, The puzzle of being social in space, \$325,000
- Dr. **Pavan Kumar Kakumani**, Biochemistry, PIWI-interacting RNA-guided somatic gene regulation in cell homeostasis and differentiation, \$155,000
- Dr. **Andrew Lang**, Biology, Bacterial gene transfer agents: mechanisms and applications, \$200,000
- Dr. **Sherri Christian**, Biochemistry, Role and regulation of extracellular vesicles generated in response to stimulation of CD24 on B lymphocytes, \$240,000
- Dr. **Eric Thiessen**, Earth Sciences, Dynamics and tectono-metamorphic framework of ultra-high temperature orogenic systems, \$130,000
- Dr. **Yiqiang Zhou**, Mathematics & Statistics, Topics in Noncommutative Ring Theory, \$90,000
- Dr. **David Pike**, Mathematics & Statistics, Combinatorial Designs, Graphs, and Networks, \$135,000

- Dr. **Chunhua Ou**, Mathematics & Statistics, Wave propagation study of abstract dynamical systems with applications, \$105,000
  - Dr. **Tom Baird**, Mathematics & Statistics, Geometry and Topology of Moduli Spaces, \$90,000
  - Dr. **Jahrul Alam**, Mathematics & Statistics, Development of a hierarchical scale-adaptive large-eddy simulation method for the study of turbulence, \$105,000
  - Dr. **James Leblanc**, Physics & Physical Oceanography, Automated analytic solutions to many-electron problems, \$205,000
- Total: \$4,525,000**

## Discovery Launch Supplements

- Dr. **Shyamchand Mayengbam**, Biochemistry, Investigating novel roles of B-vitamins in gut-host interactions, \$12,500
  - Dr. **Terrence Tricco**, Computer Science, Computational Fluid Dynamics in the Exascale Era of Computation, \$12,500
  - Dr. **Amilcar Soares**, Computer Science, Using data augmentation, active learning, and visual analytics for learning with limited examples on mobility data sets, \$12,500
  - Dr. **Qiang Ye**, Computer Science, Intelligent Networking and Computing for Next-Generation Wireless Applications, \$12,500
  - Dr. **Pavan Kumar Kakumani**, Biochemistry, PIWI-interacting RNA-guided somatic gene regulation in cell homeostasis and differentiation, \$12,500
  - Dr. **Eric Thiessen**, Earth Sciences, Dynamics and tectono-metamorphic framework of ultra-high temperature orogenic systems, \$12,500
- Total: \$75,000**

## Northern Research Supplement

- Dr. **Eric Thiessen**, Earth Sciences, Faculty of Science, Dynamics and tectono-metamorphic framework of ultra-high temperature orogenic systems, \$60,000
- Total: \$60,000**

## Research Tools and Instruments

- Dr. **Ashlyn Swift-Gallant**, Psychology, Stereology with Artificial Intelligence for Examining Cells and Circuits in Neuroscience Research, \$119,647
  - Dr. **Lindsay Cahill**, Chemistry, High resolution magic angle spinning NMR probe for biological tissue samples, \$112,774
  - Dr. **Karl Jobst**, Chemistry, A comprehensive platform to enable high-throughput sample preparation and multidimensional separation for exposomics research, \$113,884
  - Dr. **Xianta Jiang**, Computer Science, Equipment System for Developing Natural Control Interface of Next Generation Affordable Prosthetic Hands, \$88,983
  - Dr. **Sue Ziegler**, Earth Sciences, Total carbon and nitrogen analyzer for biogeochemical research spanning the terrestrial-aquatic-extraterrestrial realms, \$67,184
  - Dr. **Anand Yethiraj**, Physics & Physical Oceanography, Fluorescence correlation spectroscopy (FCS) setup for short-time diffusion and microrheology studies in soft and biological materials, \$30,619
- Total: \$533,091**

# PUBLICATIONS

## Biochemistry

[Breast Milk from Non-Obese Women with a High Omega-6 to Omega-3 Fatty Acid Ratio, but Not from Women with Obesity, Increases Lipogenic Gene Expression in 3T3-L1 Preadipocytes, Suggesting Adipocyte Dysfunction](#), *Biomedicines*, co-authored by Dr. Sukhinder Kaur Cheema.

[B Vitamins and Their Roles in Gut Health, Microorganisms](#), co-authored by Khandkar Shaharina Hossain, Sathya Amarasena and Dr. Shyamchand Mayengbam.

## Biology

[The Role of Alternative Oxidase in the Interplay between Nitric Oxide, Reactive Oxygen Species, and Ethylene in Tobacco \(\*Nicotiana tabacum\* L.\) Plants Incubated under Normoxic and Hypoxic Conditions](#), *International Journal of Molecular Sciences*, co-authored by Somaieh Zafari and Abir Igamberdiev.

## Chemistry

[Ultrahigh Size Exclusion Selectivity for Carbon Dioxide from Nitrogen/Methane in an Ultramicroporous Metal–Organic Framework](#), *Inorganic Chemistry*, co-authored by Ellan Berdichevsky, Victoria Downing, Nathan Butt, Devon McGrath, Laurie Donnelly and Dr. Michael Katz.

[Ozone uptake by commercial brake pads and brake pad components: assessing the potential indirect air quality impacts of non-exhaust emissions](#), *Environmental Science: Atmospheres*, co-authored by Devon McGrath.

[A critical evaluation of molecularly imprinted polymer \(MIP\) coatings in solid phase microextraction devices](#), *TrAC Trends in Analytical Chemistry*, co-authored by Freshteh Shahhoseini, Ali Azizi and Dr. Christina Bottaro.

[Simultaneous electropolymerization/Au nanoparticle generation at an electrified liquid/liquid micro-interface](#), *Electrochimica Acta*, co-authored by Reza Moshrefi, Evan Connors, Dr. Erika Merchrod and Dr. T. Jane Stockmann.

## Computer Science

[Machine Learning Based Multimodal Neuroimaging Genomics Dementia Score for Predicting Future Conversion to Alzheimer's Disease](#), *IOS Press*, co-authored by Dr. Karteek Popuri.

## Earth Sciences

[Global database of zinc-lead-bearing mineral deposits](#), *Geoscience Australia*, co-authored by Dr. Stephen Piercey.

[Advances in Deformable Plate Tectonic Models: 1. Reconstructing Deformable Continental Blocks and Crustal Thicknesses Back Through Time](#), *Geochemistry, Geophysics, Geosystems*, co-authored by Michael King and Dr. Kim Welford.

[Advances in deformable plate tectonic models: 2. Reconstructing the Southern North Atlantic Back Through Time](#), *Geochemistry, Geophysics, Geosystems*, co-authored by Michael King and Dr. Kim Welford.

[Age and Rate of Accumulation of Metal-Rich Hydrothermal Deposits on the Seafloor: The Lucky Strike Vent Field, Mid-Atlantic Ridge](#), *JGR Solid Earth*, co-authored by Dennis Sánchez-Mora and Dr. John Jamieson.

[Effects of Substrate Composition and Subsurface Fluid Pathways on the Geochemistry of Seafloor Hydrothermal Deposits at the Lucky Strike Vent Field, Mid-Atlantic Ridge](#), *Geochemistry, Geophysics, Geosystems*, co-authored by Dennis Sánchez-Mora and Dr. John Jamieson.

[High-Precision CA-ID-TIMS U-Pb Zircon Geochronology of Felsic Rocks in the Finlayson Lake VMS District, Yukon: Linking Paleozoic Basin-Scale Accumulation Rates to the Occurrence of Subseafloor Replacement-Style Mineralization](#), *Economic Geology*, Dr. Matthew Manor and Dr. Stephen Piercey.

[Age and Chemostratigraphy of the Finlayson Lake District, Yukon: Implications for Volcanogenic Massive Sulfide \(VMS\) Mineralization and Tectonics along the Western Laurentian Continental Margin](#), *Lithosphere GeoScienceWorld*, co-authored by Dr. Matthew Manor and Dr. Stephen Piercey.

[Mo isotope composition of the 0.85 Ga ocean from coupled carbonate and shale archives: Some implications for pre-Cryogenian oxygenation](#), *Precambrian Research*, co-authored by Dr. Michael Babechuk.

## Ocean Sciences

[Distinct realized physiologies in green sea urchin \(\*Strongylocentrotus droebachiensis\*\) populations from barren and kelp habitats](#), *Facets*, co-authored by Jasmin Schuster and Drs. Kurt Gamperl, Patrick Gagnon and Amanda Bates.

## Psychology

[Perceived and Ideal Inequality in University Endowments in the United States](#), *Personality and Social Psychology Bulletin*, co-authored by Dr. Martin Day.

[Barriers and facilitators of healthcare provider uptake of clinical practice guideline recommendations for the management of common mental health concerns: A qualitative evidence synthesis](#), *Canadian Psychology*, co-authored by Louise Bell, Emily Saunders and Dr. Joshua Rash.

[Inequality in researchers' minds: Four guiding questions for studying subjective perceptions of economic inequality](#), *Journal of Economic Surveys*, co-authored by Dr. Martin Day.

[A Preliminary Exploration of the Multimedia Principle's Applicability for Improving Comprehension of Youth Interrogation Rights](#), *Criminal Justice and Behaviour*, co-authored by Drs. Christopher Lively, Brent Snook, Kirk Luther and Meagan McCardle.

[Binge eating disorder: Updated overview for primary care practitioners](#), *Canadian Family Physician*, co-authored by Dr. Jacqueline Carter.

[The production effect is consistent over material variations: support for the distinctiveness account](#), *Memory*, co-authored by Dr. Kathleen Hourihan.