

NICOLAS RANDAZZO

📧 nicolasrandazzo.com

LinkedIn: www.linkedin.com/in/Randazzo-Nicolas

✉ randazzo@ualberta.ca

EDUCATION

MCMASTER UNIVERSITY – Ph.D in Earth Science and Environmental Sciences
(Specialization in Astrobiology) 2017 – IN PROGRESS

Thesis: High Resolution Elemental and Stable Isotope Records of the Mancos Shale for
Paleoenvironmental Reconstruction of the Late- Cretaceous

MCMASTER UNIVERSITY – M.Sc in Earth Science (Stable Isotope Geochemistry) 2015 – 2016

Thesis: Carbon and Oxygen Isotope Effects in Synthesized Carbonates at 25 °C

MCMASTER UNIVERSITY – H.BSc in Honours Environmental Sciences 2010 – 2014 GRADUATED
SUMMA CUM LAUDE

Thesis: Measuring the Isotopic Compositions of Carbon- 13 and Oxygen- 18 in Synthesized
Calcite Rafts at 25°C

MCMASTER UNIVERSITY – Minor in Religious Studies 2010 – 2014

MINI INTERDISCIPLINARY MINOR IN PLANNING 2014

BISHOP RYAN SECONDARY SCHOOL 2006 – 2010

CURRENT RESEARCH PROJECTS

- Plausibility of Milankovitch- Driven Glaciations under Ultra- Greenhouse Conditions:
Stratigraphic Correlation and Sea Level Reconstruction of the Turonian Western Interior
Seaway using Tephrochronology and Biostratigraphy (*In Preparation for GSA Bulletin*)
 - **Randazzo N., Wu T., Bhattacharya J.P., Walecki M., Fries K., Nelson R., Kim S- T., Jicha B.R. and Singer B.S.**
- The Nature of Prodeltaic Laminated Sediment Deposition and its Relation to Organic Carbon
Preservation in the Mancos Shale (*In Preparation for Paleogeography, Paleoclimatology,
Paleoecology*)
 - **Randazzo N., Gabriel J., Lourenço R.B., Reinhardt E.G., Bhattacharya J.P, Kim S- T,
and Genovese C.**

- Environmental Reconstruction of the Turonian Paleoclimate using Organic Carbon and Carbonate Stable Isotope Records from the Mancos Shale (*In Preparation for GSA Bulletin*)
 - **Randazzo N., Kim S- T., Bhattacharya J.P., and Walecki M.**

- Effect of Martian- like Radiation Conditions on Carbon and Oxygen Isotope Compositions of Carbonates (*In Preparation for Journal of Geophysical Research- Planets*)
 - **Randazzo N., Kim S- T., Stalport F., Rheinstäder M.C., Cottin H, and Coll P.**

- The Influence of Carbonic Anhydrase on the Carbon and Oxygen Isotope Effects in Synthesized Carbonates at 25°C (*In Preparation for Chemical Geology*)
 - **Randazzo N., Kim S- T., and El- Shenawy M.**

- Geochemical Fingerprinting of Late Cretaceous Bentonites from the Mancos Shale, Utah and New Mexico, USA (*Submitted to Clays and Clay Minerals*)
 - **Randazzo N., Gabriel J., Reinhardt E.G., Bhattacharya J.P., Walecki M., and Kim S- T.,**

- Mineralogy, morphology, and emplacement history of the Maaz formation on the Jezero crater floor from orbital and rover observations (*Submitted to the Journal of Geophysical Research- Planets*)
 - **Horgan B., Udry A., Rice M., Alwmark S, Amundsen H., Bell J., Crumpler L., Garczynski B., Johnson J., Kinch K., Mandon L., Merusi M., Million C., Núñez J.I., Russell P., Simon J.I., St. Clair M., Stack-Morgan K., Vaughan A., Wogsland B., Annex A, Bechtold A., Berger T., Beyssac O., Brown A., Cloutis E., Cohen B.A., Fagents S., Kah L., Farley K., Flannery D., Gupta S., Hamran S-E, Liu Y., Paar G., Quantin-Nataf C., Ravanis E., **Randazzo N., Sholes S., Shuster D., Sun V., Tate C., Tosca N., Wadhwa M., and Wiens R.C.****

- High Resolution Biostratigraphy and Chronostratigraphy of the Juana Lopez Member of the Mancos Shale and the Gallup Sandstone Formation, Northwestern New Mexico. (*In Preparation*)
 - **Nelson R., Fries K., Bhattacharya J.P, and **Randazzo N.****

- Developing tailored data combination strategies to optimize the SuperCam classification of carbonate phases on Mars (*In Preparation for Analytica Chimica Acta*)
 - **Veneranda M., Manrique J.A., Lopez-Reyes G., Julve-Gonzalez S., Rull F., Alvarez Llamas C., Gibbons E., Clave E., Cloutis E., Huidobro J., Castro K., Madariaga J.M., **Randazzo N., Brown A., Willis P., Maurice S., and Wiens R.C.****

PUBLICATIONS

Randazzo N., Kim S.- T., and Knyf M. (2019). Enzymatically- catalyzed CO₂- H₂O equilibration for oxygen isotope analyses of aqueous samples. *Rapid Communications in Mass Spectrometry*. 33(44), 1185- 1195.

Bhattacharya J., Miall A., Gabriel J., Ferron. C, **Randazzo N.**, Kynaston D., Jicha B., and Singer B. (2019). Time- stratigraphy in point sourced river deltas: application to sediment budgets, shelf construction, and paleo- storm records. *Earth Science Reviews* 199, 102985.

PATENTS

“Carbonic anhydrase- catalyzed isotope equilibrium between CO₂- H₂O for oxygen isotope analyses of aqueous samples”. U.S. Provisional Pat. Ser. No. 62/752064. Filed on Oct. 29, 2018.

RELEVANT EMPLOYMENT HISTORY

UNIVERSITY OF ALBERTA

2022

Position: Postdoctoral Researcher

- Postdoctoral Collaborator on the Mars Return Sample Science (RSS) Participating Scientist team (Sedimentology and Stratigraphy, Biosignatures, Regolith, and Atmosphere) - Leading the deployment and maintenance of fireball observatory stations across Alberta
- Developing advanced curation methods for Mars and cometary nucleus returned samples

MCMMASTER UNIVERSITY

2022

Position: Laboratory Technician

- Conducted stable isotope analysis of international water samples, natural and synthetic carbonate samples, food products (i.e., honey, molasses, etc) for adulteration assessments, sediment samples, and biological samples (shark spines, vertebrae, etc).
- Properly setup, operated and ran all of the laboratory equipment (recognize and report inaccuracy, faults and technical problems of lab instrumentation and equipment).
- Taught university undergraduate students the principles of stable isotope geochemistry using Continuous Flow- and Dual- Inlet Isotope Ratio Mass Spectrometry (CF- IRMS and DI- IRMS, respectively) and an Elemental Analyzer.
- Taught students how to use CO₂ extraction and purification line for classic stable isotope analysis as well as clumped isotope thermometry.

MCMMASTER UNIVERSITY

Position: Teaching Assistant

June - August, 2012

ENVIR SC 1A03- Climate and Water

September - December, 2014

GEOG 1HB3- Human Geographies: City and Economy

January - April, 2015; September 2015 - December 2015

EARTH SC/ENVIR SC/GEOG 3MB3- Statistical Analysis;
EARTH SC 3RD3- Research Design and Dissemination in Earth and Environmental Sciences

January - April, 2016; September - December 2016
HLTHAGE 2HI3- Geographies of Death and Disease;
GEOG 1HA3- Society and Culture

September 2017 - December 2017
EARTH SC 3CC3- Earth's Changing Climate

January 2018 - April 2018; September 2018 - December 2018
EARTH SC 3CC3- Earth's Changing Climate
EARTH SC/ ENVIR SC 3B03- Global Change, Ecosystems and the Earth System LIFE
SC 2X03- Environmental Change and Human Health

January 2019 - April 2019; September 2019 - December 2019
EARTH SC 4CC3- Stable Isotopes in Earth and Environmental Systems
EARTH SC 3CC3- Earth's Changing Climate;

January - April, 2020; September - December, 2020
EARTH SC 2T03- Geology of Canada
EARTH SC 3CC3- Earth's Changing Climate

January - April, 2021
EARTH SC 4CC3- Stable Isotopes in Earth and Environmental Systems

September - December, 2021
EARTH SC 3E03- Clastic Sedimentary Environments
EARTH SC 3CC3- Earth's Changing Climate

- Involved in both course and curriculum design on multiple occasions and provided program assessment.
- Presented guest lectures regarding both specialized and foundational concepts and skills.
- Facilitated weekly discussions and managed as well as presented information for both small and large groups ranging from roughly 10 to 90 people.
- Experience teaching both in- person and virtually (synchronous and asynchronous) -
Lead a number of hands- on laboratories, tutorials, and workshops.
- Motivated groups and individuals to complete projects.
- Coached, tutored, and mentored students.
- Marked assignments and exams, invigilated examinations, managed course websites, uploaded course content, updated grades, and answered emails regarding course

- content. - Filled in for professor for two 3rd year university lectures in the September 2017 – December 2017 term
- Taught 9 hands- on lab for a 4th year university geochemistry course within a laboratory research facility during the January 2019- April 2019 term
 - o Taught the principles and use of DI- IRMS, CF- IRMS, and Elemental Analysis for carbon, oxygen, and nitrogen isotopic analysis

MCMMASTER UNIVERSITY

September, 2017; November 2021

Position: Guest Lecturer

- Taught two lectures for each time period about environmental reconstruction using stable isotopes and paleoenvironmental proxies

MCMMASTER UNIVERSITY

June - August, 2013;

May – August, 2014;

February – May, 2017

Position: Research Student

- Analysing the stable isotope composition of synthesized carbonate precipitates
- Helped to design carbonic anhydrase- catalyzed method for rapid isotope equilibrium between CO₂- H₂O between February and May 2017

MCMMASTER UNIVERSITY

May – June, 2017

Position: Field Assistant

- Log information about sedimentary cores extracted from New Mexico at the Core Research Center (CRC) in Denver, Colorado
- Examine outcrops in Hanksville, Utah as well as Farmington, Gallup, and Socorro, New Mexico

MCMMASTER UNIVERSITY/MOHAWK COLLAGE

April, 2017;

February, 2018;

December, 2018;

April, 2019;

December, 2019

Position: Invigilator

- Distributing and collecting final examinations for students

MCMMASTER HOSPITAL

June, 2012 to May 2018

Position: Standardized patient

- Assisted in teaching program for medical students

MCMMASTER UNIVERSITY/UNIVERSITY OF NEW SOUTH WALES

U21 ASTROBIOLOGY WORKSHOP

September 2020- Present

- Collaborated with graduate students in Canada, New Zealand, and Australia to create an online origins of life workshop to be used by high school age students and continuing education students worldwide

PRESENTATIONS

Randazzo N., Wu T., Bhattacharya J.P., Walecki M., Fries K., Nelson R., Kim S.- T., Jicha B.R., and Singer B.S. Plausibility of Milankovitch- Driven Glaciations under Ultra- Greenhouse Conditions. August 2022. Cretaceous Symposium. Warsaw, Poland. *Oral Presentation (Virtual)*.

Randazzo N., Kim S.- T., Bhattacharya J.P., Rine J., and Walecki M. Environmental reconstruction and intercontinental correlation of the Turonian paleoclimate using stable isotope records from the Mancos Shale. July 2022. Goldschmidt Conference. Honolulu, Hawaii, USA. *Oral Presentation (Virtual)*.

Randazzo N., Kim S.- T., Bhattacharya J.P., Rine J., and Walecki M. Environmental reconstruction and intercontinental correlation of the Turonian paleoclimate using stable isotope records from the Mancos Shale. July 2022. Goldschmidt Conference. Honolulu, Hawaii, USA. *Poster Presentation (Virtual)*.

Randazzo N., Gabriel J., Barros Lourenco R., Reinhardt E., Kim S.- T., Bhattacharya J.P., and Genovese C. The utilization of μ XRF to predict carbon and nitrogen isotope trends in the Cretaceous Mancos C Formation, New Mexico. June 2022. Advances in Stable Isotope Techniques and Applications (ASITA). Montreal, Quebec, Canada. *Oral Presentation (In-Person)*.

Randazzo N., Wu T., Bhattacharya J.P., Kim S.-T., and Walecki M. Plausibility of Milankovitch Cycles in an Ultra Greenhouse World. November 2021. Geological Association of Canada- Mineralogical Association of Canada. London, Ontario, Canada. *Oral Presentation (In- Person)*.

Randazzo N., Kim S.-T., Stalport F., Rheinstäder M.C., Cottin H., and Coll P.. Effect of Martian- like Radiation Conditions on Carbon and Oxygen Isotope Compositions of Carbonates. February 2021. Canadian Geophysical Union- Student Conference. Hamilton, Ontario, Canada. *Oral Presentation (Virtual)*.

Randazzo N. and Kim S.-T. Stable Isotopes of Carbonates: A Tool in the Search for Life? Advances in Earth Sciences Research Conference. March, 2019. Toronto, Ontario, Canada. *Poster Presentation (In- Person)*.

Thomas A., **Randazzo N.**, Torres- Kulik, Bentley M., Bardell G., and Thierrin C.. Eliminating Space Debris: N.A.P.K.I.N. Vehicle & C.L.O.T.H. Act. Queen's Space Conference. February, 2019. Kingston, Ontario, Canada. *Oral Presentation (In- Person)*.

Randazzo N. and Kim S.-T. Stable Isotopes of Carbonates: A Tool in the Search for Life? Science of Early Life Conference. June, 2018. Hamilton, Ontario, Canada. *Poster Presentation (In- Person)*.

Randazzo N. and Kim S.-T. Resources for Future Generations (RFG) Conference June, 2018 Vancouver, British Columbia, Canada. *Poster Presentation (In- Person)*.

Randazzo N. The Coevolution of Life and Environment on Mars: An Ecosystem Perspective on the Robotic Exploration of Biosignatures. SAGANet. March, 2018. Presented Online: Hamilton, Ontario, Canada. *Oral Presentation of a paper by Nathalie Cabrol (In- Person)*.

Randazzo N., Kim S.- T., and El- Shenawy M.. Carbon and Oxygen Isotope Effects in Synthesized Carbonates at 25 °C. AGU Fall Meeting. December, 2016. San Francisco, California, USA *Poster Presentation (In- Person)*.

Kynaston D., Lee R., Kovacs S., **Randazzo N.**, and Islam A. Assessment of Petroleum Systems I Cooper Basin, Australia. AAPG Imperial Barrel Award Competition. March, 2015. Calgary, Alberta, Canada. *Oral Presentation (In- Person)*.

Randazzo N. and Kim S.- T. The Influence of Salinity of Morphology of Calcite Rafts- A New Salinity Indicator?. NSERC- USRA Poster Session. November, 2014. Hamilton, Ontario, Canada. *Poster Presentation (In- Person)*.

Randazzo N. Measuring the Isotopic Compositions of Carbon- 13 and Oxygen- 18 in Synthesized Calcite Rafts under Various Conditions. McMaster Research Day. April, 2014. Hamilton, Ontario, Canada. *Poster Presentation (In- Person)*.

JOURNAL CLUB PRESENTATIONS

7 Oral Presentations, Astrobiology Journal Club Sep 2017–Present
McMaster University, Hamilton, ON, Canada

8 Oral Presentations, School of Geography and Earth Sciences
Informal Seminar Series Club Sep 2017–Present
McMaster University, Hamilton, ON, Canada

HONOURS AND AWARDS

McMaster Graduate Student Association
Keith Leppmann Teaching Assistant Excellence Award 2015

Festitalia Young Person of Distinction Award (Under 30) 2015

- Awarded to individuals deemed to be a positive role model and an inspiration to others based upon demonstrated leadership, hard work, and initiative within an academic and/or work setting

Dean's Honour List - McMaster University

2010 – 2014

- Every year for all four years of undergraduate degree

SCHOLARSHIPS

D. Keith MacDonald Earth Sciences Scholarship	2022
Bev Bayus Graduate Scholarship	2020
McMaster Graduate Research Scholarship	2014- 2016; 2017- Present
Joseph and Joanne Lee Ontario Graduate Scholarship	2019
Ontario Graduate Scholarship	2015- 2016; 2017- 2018; 2018- 2019
McMaster Graduate Student Achievement Scholarship	2015
The Charles Murray Ball Scholarships in Earth Sciences	2014- 2015
Natural Sciences and Engineering Research Council of Canada – Undergraduate Student Research Award (NSERC- USRA)	2014
Queen Elizabeth II Aiming for the Top Scholarship	2010- 2014
The Edwin Marvin Dalley Memorial Scholarships	2013
The University (Senate) Scholarships	2012
The McMaster Honour Award, Level 2	2010

GRANTS/BURSARIES

Dr. Denis Shaw Memorial Award	2022
Walter Gibbons Memorial Travel Bursary	2022
Origins Institute Travel Award	2021
Origins Institute Travel Award	2019
Walter Gibbons Memorial Travel Bursary	2018
McMaster Centre for Climate Change Travel Grant	2018
Origins Institute Travel Award	2018
Walter Gibbons Memorial Travel Bursary	2016

OUTREACH EXPERIENCE

McMaster Origins Institute

December 2021

- Origins Expert Panelist

- Answered questions postulated by people from the USA and Canada regarding the origin of life on Earth, natural selection, exoplanets and habitability, and life on other worlds.

Invited Guest Scientist
CFMU 93.3 FM

October 2021

Invited Guest Scientist July 2021
Planet B612 Podcast

McMaster School of Geography and Earth Sciences (SGES) Social Media Committee
- Executive Social Media Student Representative May 2020- Present

- Promoted lecture series on departmental social media pages
- Personally organized departmental photo contest

McMaster Alumni Association

- Participated in “Ask a Scientist” Webinar regarding climate, weather, and natural disasters April, 2020

McMaster School of Geography and Earth Sciences (SGES) Outreach Committee
October 2019- Present

- Taught and provided hands- on Earth and Environmental Science and Biology workshops to High School Students
- Judged for the 2020 Bay Area Science and Engineering Fair

McMaster School of Geography and Earth Sciences Fall Preview October, 2017; 2018; 2019

- Promoted the departmental courses and opportunities to upcoming first year university students
- Handled and discussed natural samples to students

“May at Mac” May, 2015; 2017; 2018; 2019

- Promoted the departmental courses and opportunities to incoming first year university students

McMaster SGES Departmental Meetings- Graduate Student Representative 2015- 2016

- Attended faculty meetings & report relevant issues to the committee

McMaster Museum Day February, 2015; 2016

- Handled and discussed natural samples to students

VOLUNTEER EXPERIENCE

School of Earth, Environment, and Society (SEES) Graduate Society
- Founder and President June 2021- Present

- Created the first official university- wide club for Earth and Environmental Science and Geography students
- Organized virtual and in- person informal seminar series and local field trips
- Promoted both Academic and Social events for Graduate Students
- Assigned duties to interested Graduate Students

SGES Social Committee

- Executive Social Committee Student Representative September 2019- Present
 - Suggested and promoted events for science graduate students
 - Personally organized departmental holiday party
 - Hosted weekly “Koffee Klatch”
 - Organized informal seminar series

Science Graduate Student Association (SciGSA)

- School of Geography and Earth Sciences Representative September 2019- September 2021
 - Attended monthly meetings
 - Suggested and helped to organize events for science graduate students
 - Organized a Faculty of Science wide photo contest, scavenger hunt, and graduate STEAM events.

Bishop Ryan Catholic Secondary School

May - August, 2012

- Assisted in various learning curriculum, tutoring, and marking reports and exams
- Taught lectures and held exam review sessions

RELEVANT SKILLS

Proficiency in:

- Microsoft Office Suite
- RStudio
- PHREEQC and Geochemist’s Workbench

RELEVANT CERTIFICATIONS

Radiation Safety Training	2017
WHMIS 2015	2017