Curriculum Vitae

Neil Bennett

Personal Information

NAME AND TITLE:	Dr. Neil Bennett
ADDRESS:	Dept. of Earth Science Earth Sciences Centre 22 Ursula Franklin Street Toronto, ON M5S 3B1

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Website: https://www.neilrbennett.com

Academic Qualifications

2013 PhD	Geology (Geochemistry)	University of Toronto
2008 MSci	Geology	University of Birmingham

Employment

2023 – Present	Asst. Prof.	Dept. of Earth Science	University of Toronto
2021 – 2023	Asst. Prof. (CLTA)	Dept. of Earth Science	University of Toronto
2020 – 2021	Consultant		Saildrone
2018	Curriculum Designer		IXL Science
2013 – 2016	Postdoctoral Fellow	Geophysical Laboratory	Carnegie Inst. for Science

Research Interests

Petrology; Geochemistry; High Pressure Science; Planetary Formation and Evolution

Research Grants

CFI: *Integrated Facility for Lattice Engineering of Quantum Materials*. Innovation Fund, Co-Investigator — PIs: Stephen Julian; Xiang Li (Co-Is: Sergio de la Barrera, Stephen Julian, Hae-Young Kee, Yong Baek Kim, Young-June Kim, Xiang Li, Anatole von Lilienfeld, John Wei, Mark Wilson) (2026-2031, $3.9M)

ORF: *Integrated Facility for Lattice Engineering of Quantum Materials*. Large Infrastructure Fund, Co-Investigator — PI: Stephen Julian; Xiang Li (Co-I: Sergio de la Barrera, Stephen Julian, Hae-Young Kee, Yong Baek Kim, Young-June Kim, Xiang Li, Anatole von Lilienfeld, John Wei, Mark Wilson) (2026-2031, $3.9M)

CFI: *Simulating Planets Like Earth: SimPLE Lab.* John R. Evans Leaders Fund, Principal Investigator — (2025-2030, $164,000)

ORF: *Simulating Planets Like Earth: SimPLE Lab.* Small Infrastructure Fund, Principal Investigator — (2025-2030, $164,000)

University of Toronto: *Do Earth's Core and Mantle Chemically Communicate?* Connaught New Researcher Award, Principal Investigator — (2025-2027, $30,000)

NSERC: Magmatic Salts as Agents of Extreme Fractionation. Discovery Grant, Principal Investigator — (2021-2027, $180,000)

NSERC: Magmatic Salts as Agents of Extreme Fractionation. Launch Supplement, Principal Investigator — (2021-2027, $12,500)

Argonne National Lab: *Metal-Silicate Partitioning of W and Mo at Magma Ocean Pressures*. General User Proposal, Principal Investigator — (2014-2015, 72h total beamtime, ~$40,000 in-kind value)

Honours and Awards

2013	Barbara McClintock Fellowship	Carnegie Institution for Science
2011	Graduate Student Research Grant	Geological Society of America
2010	Graduate Award in Mineralogy and Petrology	Mineralogical Society of America
2008	Connaught Graduate Student Scholarship	University of Toronto
2006	Undergraduate Prize in Palaeontology	Palaeontological Association

Scholarly Output

Refereed

Total: 25; [†]Student authors

Submitted Manuscripts

2026

Sio, C. K., Wimpenny, J., **Bennett, N. R.**, Borg, L., Murtonen, S. E., Bormann, K., Hu, M. Y., Zhao, J., Alp, E. E., Lavina, B., Sub-solidus cooling in the mantle causes isotope variability of lunar basalt**,** *Science*. Manuscript number: AEL8607. Submitted August 26th, 2026.

†Murtonen, S. E., **Bennett, N. R.**, †Bormann K., Hu, M. Y., Zhao, J., Alp, E. E., Lavina, B., Nie, N. X., Sio, C. K. The effects of ^{57}Fe enrichment and count rates on NRIXS-derived force constants**,** *American Mineralogist*. Manuscript number: 10325, Submitted April 10th 2026.

Refereed Articles and Book Chapters

2026

Bennett, N. R., †Verschoor, J. D., Wimpenny, J., Sio, C. K. (2026) Iron isotope fractionation between solid and liquid metal in the Fe-P±Ni system: Experimental constraints and implications for meteorites, *American Mineralogist*, 111(1), 118 – 127. 10.2138/am-2025-9765

†Ricardo, B. S., **Bennett, N. R.**, Chu, X., Webster, R., Greber, N., Wille, M., Timmerman, S., Moulton, B. J. A., Sio, C. K. Titanium diffusive isotope effects in Fe-bearing basaltic glass, *Contributions to Mineralogy and Petrology*, 181:66. 10.1007/s00410-026-02345-6

2025

†Ricardo, B. S., Oeser, M., Lynn, K. J., **Bennett, N. R.**, Chu, X., Henderson, G., Liu, Y., Horn, I., Weyer, S., Sio, C. K. (2025) Boundary layer effects in melt inclusions revealed by non-traditional stable isotopes, *Geology*, 53(4), 375 – 379. 10.1130/G52248.1

2022

Bennett, N. R., Sio, C. K., Schauble, E., Lesher, C. E., Wimpenny, J., Shahar, A. (2022) Iron isotope evidence of an impact origin for main-group pallasites, *Geochemical Perspectives Letters*, 23, 6-10. 10.7185/geochemlet.2229

2021

Bennett, N. R. (2021) Controls on Element Partitioning. Encyclopedia of Geology, 2nd Edition. Elias, S. & Alderton, D. (Eds.) Amsterdam: Elsevier Academic. (Invited Submission). 10.1016/B978-0-08-102908-4.00157-0

Jackson, C. R. M., Cottrell, E., Du, Z., **Bennett, N. R.**, Fei, Y. (2021) High pressure redistribution of nitrogen and sulfur during planetary stratification, *Geochemical Perspectives Letters*, 18, 37-42. 10.1016/j.epsl.2020.116598

Jackson, C. R. M., Williams, C. D., Du, Z., **Bennett, N. R.**, Mukhopadhyay, S., Fei, Y. (2021) Incompatibility of argon during magma ocean crystallization, **Earth and Planetary Science Letters**, 553, 116598. 10.1016/j.epsl.2020.116598

2020

Sio, C. K., Parsons-Davis, T., Lee, E., Pascall, A., Kuntz, J. D., Wimpenny, J., Goodell, J., Roberts, K. E., Bandong, B. B., **Bennett, N. R.** (2020) Additive manufacturing of platinum group

element (PGE) reference materials with a silica matrix. *Rapid Communications in Mass Spectrometry*, 34, e8627,1-9. 10.1002/rcm.8627

Lesher, C. E., Dannberg, J., Barfod, G. H., **Bennett, N. R.**, Glessner, J., Lacks, D., Brenan, J. M. (2020) Iron isotope fractionation at the core-mantle boundary, *Nature Geoscience*, 13, 382-386. 10.1038/s41561-020-0560-y

2019

Brenan, J. M., Mungall, J. E., **Bennett, N. R.** (2019) Control of the highly siderophile elements in lunar basalts by iron sulfide melt. *Nature Geoscience*. 12, 701-706. 10.1038/s41561-019-0426-3

Rizo, H., Andrault, D., **Bennett, N. R.**, Humayun, M., Brandon, A., Vlastelic, I., Moine, B., Poirier, A., Bouhifd, M., Murphy, D. T. (2019) ^{182}W evidence for core-mantle interaction in the source of mantle plumes. *Geochemical Perspectives Letters*, 11, 6-11. 10.7185/geochemlet.1917

2018

Bennett, N. R. & Fei, Y. (2018) Pressure, sulfur and metal-silicate partitioning: The effect of sulfur species on the parameterization of experimental results. *American Mineralogist*, 103, 1068-1079. 10.2138/am-2018-6282

Sio, C. K., Roskosz, M., Dauphas, N., **Bennett, N. R.**, Mock, T., Shahar, A. (2018) The isotope effect for Mg-Fe interdiffusion in olivine and its dependence on crystal orientation, composition and temperature. *Geochimica et Cosmochimica Acta*, 239, 463-480. 10.1016/j.gca.2018.06.024

Jackson, C. R. M., **Bennett, N. R.**, Du, Z., Cottrell, E., Fei, Y. (2018) Early episodes of high-pressure core formation preserved in plume mantle. *Nature*, 553, 491-495. 10.1038/nature25446

2017

Du, Z., Jackson, C. R. M., **Bennett, N. R.**, Driscoll, P., Fei, Y., Deng, J., Lee, K., Greenberg, E., Prakapenka, V. (2017) Insufficient energy from MgO exsolution to power early geodynamo. *Geophysical Research Letters*, 44, 1-6. 10.1002/2017GL075283

2016

Bennett, N. R., Brenan, J. M., Fei, Y. (2016) Magma ocean thermometry: Controls on the metal-silicate partitioning of gold, *Geochimica et Cosmochimica Acta*, 184, 173-192. 10.1016/j.gca.2016.03.031

Brenan, J. M., **Bennett, N. R.,** Zacjacz, Z. (2016) Experimental results on fractionation of the highly siderophile elements (HSE) at variable pressures and temperatures during planetary and magmatic differentiation, *Reviews in Mineralogy and Geochemistry*, 81. (Invited Submission) 10.2138/rmg.2016.81.1

2015

Bennett. N. R., Brenan, J. M., Fei, Y. (2015) Metal-silicate partitioning experiments at high pressure and temperature: experimental methods and a procedure for the highly siderophile elements, *Journal of Visualized Experiments*, 100. (Invited Submission) 10.3791/52725

2014

Bennett, N. R., Brenan, J. M., Koga, K. T. (2014) The solubility of platinum in silicate melt under reducing conditions: results from experiments without metal inclusions, *Geochimica et Cosmochimica Acta*, 133, 422-442. 10.1016/j.gca.2014.02.046

2013

Smythe, D. J., Brenan, J. M., **Bennett, N. R.**, Regier, T., Henderson, G. S. (2013) Quantitative determination of cerium oxidation states in alkali-aluminosilicate glasses using $M_{4,5}$-edge XANES, *Journal of Non-Crystalline Solids*, 378, 258-264. 10.1016/j.jnoncrysol.2013.07.017

Bennett, N. R. & Brenan, J. M. (2013) Controls on the solubility of rhenium in silicate melt: implications for the osmium isotopic composition of Earth's mantle, *Earth and Planetary Science Letters*, 361, 320-332. 10.1016/j.epsl.2012.10.028

2011

Stevenson, C. T. E. & **Bennett, N. R. (**2011) The emplacement of the Palaeogene Mourne Granite Centres, Northern Ireland: new results from the Western Mourne Centre. *Journal of the Geological Society*, 168, 831-836. 10.1144/0016-76492010-123

2010

Brenan, J. M. & **Bennett, N. R.** (2010) Soret separation of highly siderophile elements in Fe–Ni–S melts: implications for solid metal–liquid metal partitioning, *Earth and Planetary Science Letters*, 298, 299-305. 10.1016/j.epsl.2010.07.044

Non Refereed

Total: 1 (2023 – Present);

Field Guides

2023

Brenan, J. M., **Bennett, N. R.** (2023) Association of Women Geoscientists Field Guide to Western Newfoundland: Part I.

Presentations

Total: 33 (2009 - Present); †Student authors

Conference Presentations

2026

Bennett, N.R., †Munro, W. K. (2026) Experimental techniques for separating immiscible silicate liquids: Toward improved phase relations and trace element partition coefficients**,** Goldschmidt Conference.

†Diwansingh, K., Sio, C.K., **Bennett, N.R.** (2026) Iron isotope fractionation between IIAB and IIG irons: a record of liquid immiscibility? Goldschmidt Conference.

Gregory, D. D., Dong, C., **Bennett, N.R.,** †Cann, J., †Carter, J., †Herdem-Yucel, D., †Pawlowski, J., Chappaz, A., Hastie E.C.G. (2026) Towards a new model for the formation of some orogenic gold deposits, Goldschmidt Conference.

†Mount, S., Sio, C. K., **Bennett, N. R.** (2026) Magnesium isotopes reveal thermal gradients within the “hot-spot” of piston-cylinder assemblies, Goldschmidt Conference.

†Murtonen, S. E., **Bennett, N. R.** (2026) Experimental determination of highly siderophile element diffusivities in silicate melt: Implications for core formation, Goldschmidt Conference.

Sio, C. K., Wimpenny, J., **Bennett, N. R.**, Borg, L., †Murtonen, S. E., †Bormann, K., Hu, M. Y., Zhao, J., Alp, E. E., Lavina, B. (2026) Kinetic effects in source regions explain the Fe isotope dichotomy of lunar basalts, Goldschmidt Conference.

†Yuan, Z., **Bennett, N. R.** (2026) Magnetite solubility and trace element partitioning in carbonate-sulfate-phosphate-silicate melts: implications for recent models of iron oxide-apatite ore formation, Goldschmidt Conference.

2025

†Munro, W. K., **Bennett, N. R.** (2025) Exploring two-liquid separation of fluorosilicate melts: Advancing phase relationships and mineralization insights for granite hosted REE deposits, Society of Economic Geologists Annual Meeting. Poster.

†Yuan, Z., **Bennett, N. R.** (2025) Molten salts as agents of metal enrichment in IOA deposits, Prospectors and Developers Association of Canada Convention. Poster.

†Pawlowski, J., **Bennett, N. R.** (2025) Experimental Insights into Pyrite-Fluid Trace Element Partitioning in Hydrothermal Systems, Prospectors and Developers Association of Canada Convention. Poster.

2024

†Mount, S., Sio, C. K. **Bennett, N. R.** (2024) Ionic modelling of equilibrium isotope fractionation between olivine and basaltic melt, American Geophysical Union - Fall Meeting. Poster.

Sio, C. K., †Ricardo, B. S., Oeser, M., Lynn, K. J., **Bennett, N. R.**, Chu, X., Henderson, G., Liu, Y., Horn, I., Weyer, S. (2025) Using stable isotopes to identify boundary layer effects in melt inclusions, American Geophysical Union - Fall Meeting. Talk.

†Munro, W. K., **Bennett, N. R.** (2024) Thermal separation as an alternative to centrifugation for two-liquid partitioning studies, Goldschmidt Conference. Talk.

†Munro, W. K., **Bennett, N. R. (**2024) Thermal separation of silicate-fluorosilicate melts: trace element partitioning and implications for granite-hosted REE deposits, Society of Economic Geologists Conference. Poster.

†Nickel, J. A. D., **Bennett, N. R.**, Julian, S. R. (2024) Pressurized synthesis and measurement of palladium oxides, Fundamentals of Quantum Materials Winter School. Poster.

2023

Bennett, N. R., †Verschoor, J. D., Wimpenny, J., Sio, C. K. (2023) The influence of solid structure and liquid composition on Fe isotope fractionation between solid and liquid alloys; Goldschmidt Conference, Poster.

†Murtonen, S., Sio, C. K., †Bormann, K., **Bennett, N. R.** (2023) Determining the effect of ^{57}Fe enrichment on NRIXS-derived force constants; Goldschmidt Conference. Poster.

Sio, C. K. **Bennett, N. R.**, Schauble, E., Lesher, C. E., Wimpenny, J., Shahar, A. (2023) Iron isotope evidence of an impact origin for the formation of pallasite meteorites; Goldschmidt Conference. Talk.

†Guillerez, A., †Yuan, Z., Sio, C. K., **Bennett, N. R.** (2023) Magnetite as a petrogenetic indicator for the formation of iron-oxide apatite deposits, GACMAC Meeting. Poster.

2022

Bennett, N. R., †Verschoor, J. D., Sio, C, K. (2022) Probing the Compositional Effects on Fe Isotope Fractionation Between Solid and Liquid Metal Alloys. Goldschmidt Conference. Poster.

Sio, C. K., Render, J., Wimpenny, J., Lesher, C. E., Brenan, J. M., **Bennett, N. R.** (2022) A Search for Isotopic Evidence of Thermodiffusion at the Core-Mantle Boundary. Goldschmidt Conference. Talk.

Bennett, N. R., Sio., C. K., Schauble, E., Lesher, C. E., †Edwards, P., Wimpenny, J., Shahar, A. (2022) Experimentally Determined Fe-Isotope Fractionation Between Metal and Olivine: Implications for Pallasite Formation. GACMAC Meeting. Talk.

2021

Jackson, C. R. M., Cottrell, E., Du, Z., **Bennett, N. R.**, Fei, Y. (2021) High Pressure Redistribution of Nitrogen and Sulphur During Planetary Stratification. American Geophysical Union - Fall Meeting. Poster.

Sio, C. K., Render, J., Wimpenny, J., Lesher, C. E., Brenan, J. M. & **Bennett, N. R.** (2021) Nickel Isotope Fractionation in Fe-Ni and Fe-Ni-S Alloys by Thermodiffusion. American Geophysical Union - Fall Meeting. Talk.

2020

Sio, C. K., Parsons-Davis, T., Lee, E., Pascall, A., Kuntz, J. D., Wimpenny, J., Goodell, J., Roberts, K. E., Bandong, B. B., **Bennett, N. R.** (2020) Additive manufacturing of PGE standards with a silica matrix. Goldschmidt Conference. Talk.

Jackson, C. R. M., Cottrell, E., Du, Z., **Bennett, N. R.**, Fei, Y. Core Formation and Magma Ocean Outgassing Set Planetary NSC Ratios. (2020) American Geophysical Union - Fall Meeting. Poster.

2016

Bennett, N. R. & Fei, Y. Pressure, Sulfur and Metal-Silicate Partitioning: Does the Formation of Metal-Sulphur Species in Silicate Melt Affect the Parameterisation of Experimental Results? (2016) American Geophysical Union - Fall Meeting. Poster.

Bennett, N. R., Jackson, C. R. M., Du, Z., Fei, Z. (2016) Planetary Differentiation in the Laboratory: Methods for Metal-Silicate Partitioning Experiments in the Diamond Anvil Cell and their Application to Tungsten. Geological Society of America Annual Meeting. Poster.

2014

Bennett, N. R. & Fei, Y. (2014) Element Redistribution in Fe-Ni-O Melts by a Thermal Gradient: Implications for Siderophile Element Partitioning During Core Formation and Crystallization, American Geophysical Union - Fall Meeting. Poster.

2012

Bennett, N. R. & Brenan, J. M. (2012) Equilibrium Core Formation Loses its Lustre: High Pressure and Temperature Partitioning of Gold, Goldschmidt Conference. Talk.

2011

Bennett, N. R. & Brenan, J. M. (2011) Suppression of Metal Inclusions and the Effect of Carbon on Pt Solubility in Haplobasalt at High Pressure and Temperature, American Geophysical Union Fall Meeting. Poster.

Bennett, N. R. & Brenan, J. M. (2011) The Metal-Silicate Partitioning of Re & Pt: Constraining Mantle Os Isotope Systematics, GACMAC Meeting. Talk.

Invited Talks

2023

Bennett, N. R. (2023) Minerals, melts, pressure, heat: A recipe for exploring planetary differentiation, University of Toronto, Canada.

2019

Bennett, N. R. (2019) Noble metal logistics: Distributing highly siderophile elements between the core and mantle, Bayerisches Geoinstitut (BGI), Germany.

2016

Bennett, N. R. (2016) Experimental results on fractionation of the highly siderophile elements (HSE) at variable pressures and temperatures during planetary and magmatic differentiation, RiMG Short Course, Scripps Institution of Oceanography, USA.

Bennett, N. R. (2016) Magma ocean thermometry: experiments on the metal-silicate partitioning of Au, University of Maryland, USA.

2015

Bennett, N. R. (2015) The formation of planets and their cores: Metals, magma-oceans, and chemistry at extreme conditions, Carnegie Institution of Washington, USA.

2014

Bennett, N. R. (2014) Terrestrial accretion and core formation: insights from the highly siderophile elements, Smithsonian Museum of Natural History, USA.

Bennett, N. R. (2014) Metal-silicate partitioning: Consequences for the late-veneer and conditions of core-metal segregation, Carnegie Institution of Washington, USA.

Bennett, N. R. (2014) Metal-silicate partitioning: consequences for the late-veneer and conditions of core metal segregation, University of Maryland, USA.

2009

Bennett, N R. (2009) Lateral emplacement of the Western Mourne Granite, N. Ireland, from AMS fabric data, AGU Joint Assembly, Canada.

Media and Other Public Engagements

2026 University of Toronto A&S News: https://www.artsci.utoronto.ca/news/earth-science-students-explore-deep-geological-past-southwestern-england
2022 University of Toronto A&S News: https://www.artsci.utoronto.ca/news/earth-sciences-researchers-probe-origin-most-beautiful-meteorites

Teaching Experience

Undergraduate

University of Toronto: International Course Module; United Kingdom, (2026; Winter)
University of Toronto: Igneous Petrology, ESS322 (2025, 2026; Winter)
University of Toronto: International Course Module; Chile, (2025; Winter)
University of Toronto: Our Home Planet, ESS105 (2023, 2024, 2026; Winter)
University of Toronto: Directed Studies, ESS390 (2023, Winter)
University of Toronto: Capstone Field Course, ESS490 (2022, 2023; Summer)

California State University, East Bay: Introductory Chemistry, CHEM100 (2019 Fall, 2020 Winter)

Graduate

University of Toronto: Geochemistry, ESS2304 (2026, Winter)
University of Toronto: Thermodynamics of Element Partitioning, ESS3000 (2025, Winter)
University of Toronto: Capstone Field Course, ESS3000 (2022, Summer)

Teaching Assistantships

University of Toronto: Capstone Field Course (2012, Summer)
University of Toronto: Whitefish Falls Field Course (2009 – 2012, Summer)
University of Toronto: Igneous and Metamorphic Petrology (2008, 2009, 2011 Fall)
University of Toronto: Structural Geology (2010, Winter)
University of Toronto: Introductory Geology (2010, Winter)
University of Toronto: Introduction to Mineralogy (2008 – 2009, Fall)

Supervisory Experience

Graduate Student Supervision

Primary/Co-Advisor: PhD Students

2024 – Present	Primary Advisor	Shannon Murtonen
2023 – Present	Co-Advisor	Sarah Mount
2022 – Present	Primary-Advisor	Zhongzheng Yuan
2021 – Present	Co-Advisor	Bruna da Silva Ricardo

Primary/Co-Advisor: Master's Students

2024 – 2025	Primary Advisor	Jordan Pawlowski
2023 – 2024	Primary Advisor	Wil Munro
2022 – 2023	Primary Advisor	Jessica Verschoor

Graduate Student Supervisory Committees

Committee Member: PhD Students

2026 – Present	Lauren MacFarlane
2025 – Present	Candice Shaw
2023 – Present	Juan David Bello Rodriguez
2023 – 2025	Bo Peng

Examining committee only:

2024	Sheila Ballentine	(Proposal Defence)
2023	Zhenhao Zhou	(Thesis Defence)
2023	Junxing Chen	(Thesis Defence)
2022	David Summer	(Proposal Defence)
2022	Nelson Román	(Proposal Defence)

Committee Member: Master's Students

2024 – 2025	Elizabeth Xu
2024 – 2025	Eve Carrothers
2024 – 2025	Jennifer Cann

2023 – 2024	Shannon Murtonen
2023 – 2024	Dani Lorenzo
2023 – 2024	Ozgur Tekin
2022 – 2023	Tina Tsan
2021 – 2022	Joy Carter
2021 – 2022	Dilem Herdem

Undergraduate Student Research Supervision

2025 – 2026	Senior Thesis	(ESS492Y)	Erica Rose
2023	Directed Studies	(ESS291H1)	Zeynep Uzunel
2022 – 2023	Senior Thesis	(ESS492Y)	Katherine Bormann
2022 – 2023	Work-Study	(N/A)	Jamie Chow

Professional Service

2025	Session Convenor/Chair	GACMAC Conference
2023	Field Trip Co-Lead	Association of Women Geoscientists
2022	Session Convenor/Chair	GACMAC Conference
2022	Session Convenor/Chair	Goldschmidt Conference
2019	Scholarship Interviewer	Meritus (10,000 Degrees)
2015	Session Convenor/Chair	Goldschmidt Conference

University Service

2025 – Present	Departmental Seminar Organizer	Dept. of Earth Sciences
2024 – Present	PursueSTEM Grade 10 Activity Lead	Dept. of Earth Sciences
2023 – 2026	Analytical Services Committee Chair	Dept. of Earth Sciences
2026	PTR committee member	Dept. of Earth Sciences
2025	Enrichment Academy Activity Lead	Dept. of Earth Sciences
2021– 2023	Outreach Committee Member	Dept. of Earth Sciences
2021– 2023	Analytical Services Committee Member	Dept. of Earth Sciences
2011– 2012	AGGS President	Dept. of Earth Sciences
2010 – 2011	Rockfest Seminar Organizer	Dept. of Earth Sciences
2011 – 2012	Graduate Student Union Representative	Dept. of Earth Sciences
2011– 2012	AGGS President	Dept. of Earth Sciences