

Ryan Ben Ickert

CURRICULUM VITAE

Department of Earth, Atmospheric, and Planetary Sciences, Purdue University, West Lafayette, IN, 47901
phone: +1 (765) 494-6574 • email: ickert@purdue.edu

May 5, 2022

RESEARCH INTERESTS

I use geochemistry, especially isotope geochemistry, to attack a broad range of scientific problems. This includes using high-precision ID-TIMS U-Pb geochronology to determine timescales of magmatic processes and to date geological events; using radiogenic isotopes (Sr-Nd-Pb) to trace the age and origin of rocks, meteorites, teeth, and archeological materials; and using light stable isotopes to trace the origin of diamonds and the deep carbon cycle. I am also interested in the fundamental basis of isotope measurements and geochronology. This has led me to work on improving our understanding of decay rates of radioactive nuclides, mass spectrometry techniques, and optimizing data handling and reduction.

POSITIONS HELD

2019 – present Senior Research Scientist & Research Faculty, Purdue University

2015-2019 Lecturer (Assistant Professor), Scottish Universities Environmental Research Centre

2012-2015 Postdoctoral Fellow, Berkeley Geochronology Center and UC Berkeley

2009-2012 Postdoctoral Fellow, Canadian Centre for Isotopic Microanalysis, University of Alberta

EDUCATION

2010 – PhD Research School of Earth Sciences, The Australian National University
Advisor: Ian S. Williams

2006 – MSc Department of Earth Sciences, Simon Fraser University
Advisor: Derek J. Thorkelson

2003 – BSc Department of Earth and Atmospheric Sciences, University of Alberta
Advisor: Octavian Catuneanu

SERVICE

- Member of the Commission on Isotopic Abundances and Atomic Weights (CIAAW) Subcommittee on Isotopic Abundance Measurements (SIAM) (2021-present)
- Member of the Joint IUPAC-IUGS Task Group on Isotope Data in Geosciences (2017-present)
- Journal reviewer for Earth and Planetary Science Letters, Chemical Geology, Geochimica et Cosmochimica Acta, Lithos, Journal of Analytical Atomic Spectroscopy, Journal of Volcanology and Geothermal Research, Economic Geology, Earth Science Reviews, Precambrian Research, Journal of the Geological Society of India, Scientific Reports, Contributions to Mineralogy and Petrology, Rapid Communications in Mass Spectrometry
- Grant proposal reviewer for NSF and NSERC
- Language editor of Central European Journal of Geoscience, 2010-2016

STUDENT SUPERVISION

Rasika S. Mahajan (PhD) SUERC. 2016-present.

Emma Roberts (PhD) SUERC. 2017-2020.

Duncan Bowyer (BSc, Paneth Internship) SUERC 2018

Disha Okhai (committee member, PhD) Purdue University. 2020-present.

Keita Wade (BSc, Stahura Meteorite Intern) Purdue University. 2021-present.

FUNDING

- (Co-I) NERC Standard Grant “*Convection clashes: Plume splitting beneath eastern Australia*”. (PI: Lara Kalnins) £1 127 353.05; Funded 2019
- (Co-I) STFC Standard Proposal “*Building capability for Mars Sample Return: development of geochronological tools for dating of jarosite*”. £87 570; Funded 2019
- (PI) Royal Society Research Grant “*Evaluating the use of the Rb-Sr system to date young (Amazonian) aqueous alteration on the surface of Mars*” (£19 728.50) Funded 2018
- (PI) Carnegie Research Incentive Grant “*Pb isotopes: A novel high-resolution correlation tool for cyclostratigraphy*” (£7 357 (Funded 2017)
- (Postdoc) NSR EAR “*Collaborative Research: Filling a 30 Ma gap: Building a chronostratigraphic framework for Late Triassic sedimentary and paleobiologic archives*” (Lead PI – Roland Mundil and Randall Irmis) \$169 975 (Funded 2014)

TEACHING

Purdue University: EAPS 100: Planet Earth, Summer 2021, 2022

SUERC: Geochronology Seminar (not for credit), 2016

PUBLICATIONS

- Drake S.J., Gomez-Rivas E., **Ickert R.B.**, Macdonald D.I.M. *in press*. Temporal and spatial variations in calcium carbonate deposition in a mixed siliciclastic-carbonate deep marine system: The Ediacarian Deeside Limestone Formation; Aboyne, Scotland. *Scottish Journal of Geology*.
- Cannings T., Balmer E.M., Coletti G., **Ickert R.B.**, Kroon D., Raffi I., Robertson A.H.F., 2021. Microfossil and strontium isotope chronology used to identify the controls of Miocene reefs and related facies in NW Cyprus. *Journal of the Geological Society*. v.178, 18p. <https://doi.org/10.1144/jgs2020-081>
- Casetta F., **Ickert R.B.**, Mark D.F., Giacomoni P.P., Bondiman C., Ntaflos T., Zenetti A., Coltorti M., 2021. The Variscan subduction inheritance in the Southern Alps Sub-Continental Lithospheric Mantle: Clues from the Middle Triassic shoshonitic magmatism of the Dolomites (NE Italy). *Lithos*. v.380-381, 105856. <https://doi.org/10.1016/j.lithos.2020.105856>.
- Carter J., **Ickert R.B.**, Mark D.F., Tremblay M.M., Cresswell A.J., Sanderson D.C.W., 2020. Production of ^{40}Ar by an overlooked mode of ^{40}K decay with implications for K-Ar geochronology. *Geochronology*. v.2(2) p.355-365. <https://doi.org/10.5194/gchron-2-355-2020>
- Villa I.M., Holden N.E., Possolo A., **Ickert R.B.**, Hibbert B., Renne P.R. 2020. IUPAC-IUGS recommendation on the half-lives of ^{147}Sm and ^{146}Sm . *Geochimica et Cosmochimica Acta*. v.285, p. 70-77. <https://doi.org/10.1016/j.gca.2020.06.022>
- Iles K.A., Hergt J.M., Woodhead J.D., **Ickert R.B.**, Williams I.S., 2020. Petrogenesis of granitoids from the Lachlan Fold Belt, southeastern Australia: the role of disequilibrium melting. *Gondwana Research*. v.79, p. 87-109. <https://doi.org/10.1016/j.gr.2019.08.011>
- Tulan E., Sachsenhofer R.F., Tari G., Flecker R., Fairbank V., Pupp M., **Ickert R.B.**, 2020. Source rock potential and depositional environment of the Lower Oligocene Ihsaniye Formation in NW Turkey (Thrace, Karaburun). *Turkish Journal of Earth Sciences*. v.28, p. 64-84. <http://dx.doi.org/10.3906/yer-1906-14>
- Casetta F., **Ickert R.B.**, Mark D.F., Bonadiman C., Giacomoni P.P., Coltorti M., 2019. The alkaline lamprophyres of the Dolomitic Area (Southern Alps, Italy): markers of the Late Triassic change from orogenic-like to anorogenic magmatism. *Journal of Petrology*. v.60(6), p. 1263-1298. <http://dx.doi.org/10.1093/petrology/egz031>
- Regier M., Mišković A., **Ickert R.B.**, Pearson G.D., Stachel T., Stern R.A., Kopylova M. 2018. An oxygen isotope test for the origin of Archean mantle roots. *Geochemical Perspectives Letters*, v.9, p.6-10. <http://dx.doi.org/10.7185/geochemlet.1830>
- Casetta F., Coltorti M., **Ickert R.B.**, Bonadiman C., Giacomoni P.P., Ntaflos T., 2018. Intrusion of shoshonitic magmas at shallow crustal depth: T-P path, H₂O estimates and AFC modelling of the Middle Triassic Predazzo Intrusive Complex (Southern Alps, Italy). *Contributions to Mineralogy and Petrology*, v.173, 27pg. <https://doi.org/10.1007/s00410-018-1483-0>
- Riches A.J.V., **Ickert R.B.**, Pearson D.G., Stern R.A., Jackson S.A., Ishikawa A., Kjarsgaard B.A., Gurney J.J., 2016. In situ oxygen-isotope, major-, and trace-element constraints on the metasomatic modification and crustal origin of a diamondiferous eclogites from Roberts Victor, Kaapvaal Craton. *Geochimica et Cosmochimica Acta* v.174, p. 345-359. <http://dx.doi.org/10.1016/j.gca.2015.11.028>
- Fox M., **Ickert R.B.**, 2015. Model selection during sample-standard-bracketing using reversible jump Markov chain Monte Carlo. *Journal of Analytical Atomic Spectrometry* v.30, p. 2208-2213. <http://dx.doi.org/10.1039/c5ja00102a>
- Ickert R.B.**, Mulcahy S.R., Sprain C.J., Manaszak J.F., Renne P.R., 2015. Chemical and Pb isotope composition of phenocrysts from bentonites constrains the chronostratigraphy around the Cretaceous-Paleogene boundary in the Hell Creek region, Montana. *Geochemistry, Geophysics, Geosystems* v.16, p. 2743-2761. <http://dx.doi.org/10.1002/2015GC005898>
- Ickert R.B.**, Stachel T., Stern R.A., Harris J.W., 2015. Extreme ^{18}O -enrichment in majorite constrains a crustal origin of transition zone diamonds. *Geochemical Perspectives Letters* v.1, p. 65-74. <http://dx.doi.org/10.7185/geochemlet.1507>

- Ickert R.B.**, Mundil R., Magee C.W., Mulcahy S.R., 2015. The U-Th-Pb systematics of zircon from the Bishop Tuff: A case study in the challenges to high-precision Pb/U geochronology at the millennial scale. *Geochimica et Cosmochimica Acta* v.168, p. 88-110. <http://dx.doi.org/10.1016/j.gca.2015.07.018>
- Smit, K.V., Stachel, T., Creaser, R.A., **Ickert, R.B.**, DuFrane, S.A., Stern, R.A., Seller, M. 2014. Origin of eclogite and pyroxenite xenoliths from the Victor kimberlite, Canada, and implications for Superior craton formation. *Geochimica et Cosmochimica Acta* v.125, p. 308-337. <http://dx.doi.org/10.1016/j.gca.2013.10.019>
- Ickert R.B.**, Stern R.A. 2013. Matrix corrections and error analysis in high-precision SIMS $^{18}\text{O}/^{16}\text{O}$ measurements of Ca-Mg-Fe garnet. *Geostandards and Geoanalytical Research*. <http://dx.doi.org/10.1111/j.1751-908X.2013.00222.x>
- Ickert, R.B.**, Stachel, T., Stern R.A., Harris, J.W., 2013. Diamond from recycled crustal carbon documented by coupled $\delta^{18}\text{O}$ - $\delta^{13}\text{C}$ measurements of diamonds and their inclusions. *Earth and Planetary Science Letters* v.364, p. 85-97. <http://dx.doi.org/10.1016/j.epsl.2013.01.008>
- Ickert, R.B.** 2013. Algorithms for estimating uncertainties in initial radiogenic isotope ratios and model ages. *Chemical Geology* v.340, p 131-138. <http://dx.doi.org/10.1016/j.chemgeo.2013.01.001>
- Park, J.-W., Campbell, I.H., **Ickert, R.B.**, Allen, C.M., 2012. Chalcophile element geochemistry of the Boggy Plain zoned pluton, southeastern Australia: a S-saturated barren compositionally diverse magmatic system. *Contributions to Mineralogy and Petrology*, v.165(2), 217-236. <http://dx.doi.org/10.1007/s00410-012-0806-9>
- Smart, K.A., Chacko, T., Stachel, T., Tappe, S., Stern, R.A., **Ickert, R.B.**, EIMF, 2012. Eclogite formation beneath the northern Slave craton constrained by diamond inclusions: Oceanic lithosphere origin without a crustal signature. *Earth and Planetary Science Letters* v.319-320, p. 319-320. <http://dx.doi.org/10.1016/j.epsl.2011.12.032>
- Ickert R.B.**, Williams I.S, 2011. U- Pb Zircon Geochronology of Siluro-Devonian Granites in Southeastern Australia: Implications for the Timing of the Benambran Orogeny and the I-S Dichotomy. *Australian Journal of Earth Sciences*, v.58(5), p. 501-516. <http://dx.doi.org/10.1080/08120099.2011.562922>
- Ickert R.B.**, Williams I.S., Wyborn D, 2011. Ti in Zircon from the Boggy Plain Zoned Pluton; Implications for Zircon Petrology and Hadean Tectonics. *Contributions to Mineralogy and Petrology*. v.162(2), p. 447-461. <http://dx.doi.org/10.1007/s00410-010-0605-0>
- Ickert R.B.**, Thorkelson D.J., Marshall D.D., Ullrich T.D., 2009. Eocene adakitic volcanism in southern British Columbia: Remelting of arc basalt above a slab window. *Tectonophysics*, v.464(1-4), p. 164-185. <http://dx.doi.org/10.1016/j.tecto.2007.10.007>.
- Ickert R.B.**, Hiess J., Williams I.S., Holden P., Ireland T.R., Lanc P., Schram N., Foster J.J., Clement S.W., 2008. Determining high precision in situ, oxygen isotope ratios with a *SHRIMP II*: Analyses of MPI-DING silicate-glass reference materials and zircon from contrasting granites. *Chemical Geology*, v.257(1-2), p. 114-128. <http://dx.doi.org/10.1016/j.chemgeo.2008.08.024>.
- Yeo G.M., Percival J.B., Jefferson C.W., **Ickert R.**, and Hunt P., 2007. Environmental significance of oncoids and crypto-microbial laminites from the Late Paleoproterozoic Athabasca Group, Saskatchewan and Alberta; in *EXTECH IV: Athabasca Uranium Multidisciplinary Study*, Saskatchewan and Alberta, (ed.) C.W. Jefferson and G. Delaney; Geological Survey of Canada, Bulletin 588, p. 315-323. <http://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/shorte.web&search1=R=223777>.

CONFERENCE PROCEEDINGS (last 10 years)

- McLean N.M., **Ickert R.B.**, Multidynamic Mass Spectrometer Measurements Revisited, 2022. Goldschmidt 2022.
- Ickert R.B.**, Trace actinides in common U reference materials may bias measurements of UO_2^+ by TIMS. Goldschmidt 2022.
- Casetta F., **Ickert R.B.**, Mark D.F., Bonadiman C., Giacomoni P.P., Ntaflos T., Coltorti M., 2020. Volatile-rich melts as markers of the asthenospheric influx prior to rifting events: the case of the alkaline-carbonatitic lamprophyres of the Dolomitic Area (Southern Alps, Italy). EGU General Assembly 2020.
- Mahajan R.S., **Mark D.F.**, Ickert R.B., 2019. Building an accurate and precise chronological framework for the British Palaeogene Igneous Province. AGU Fall Meeting, San Francisco.
- Ickert R.B.**, Carter J.N., Mark D.F., Tremblay M.M., Cresswell A., Sanderson D.C.W., Percent-level production of ^{40}Ar by an overlooked mode of ^{40}K decay. AGU Fall Meeting, San Francisco.
- Mahajan R.S., **Ickert R.B.**, Mark D.F., 2019. Building an accurate and precise chronological framework for the British Paleogene Igneous Province. EGU: Mass extinctions, recovery and resilience meeting, Utrecht.
- Papadopoulos V., Boyce A., Mark D., **Ickert R.**, Tsikos H., 2019. Investigation of large-scale brine circulation as mechanism of ore formation in the Kalahari and Postmasburg Fe-Mn fields, South Africa. Society for Geology applied to Mineral Deposits Biennial Meeting, Glasgow.
- Ickert R.B.**, Mahajan R.S., Carter J., Gallagher V., Kelly A., Mark D.F., 2017. Extending the utility of multi-dynamic MC-TIMS by optimal use of redundant data. Goldschmidt 2017.
- Mahajan R.S., **Ickert R.B.**, Mark D.F., 2017. Assembly of the British Tertiary Igneous Province. Goldschmidt 2017.
- Mark D.F., Ickert R.B., Mahajan R.S., Dymock R., Imlach J., 2017. Interrogation of apparent age dispersion in $^{40}\text{Ar}/^{39}\text{Ar}$ neutron fluence monitor minerals. Goldschmidt 2017.
- Pearson D.G., Stachel T., Palot M., **Ickert R.B.**, 2015. History of crustal recycling recorded in transition zone diamonds. AGU Fall Meeting, San Francisco, California.
- Mundil R., **Ickert R.B.**, Simon J.I., Renne P.R., 2015. Considering the Complexities of U-Pb geochronology at the millennial scale. AGU Fall Meeting, San Francisco, California.
- Ickert R.B.**, Mundil R., Sharp W.D., 2014. High-precision Th-Pb dating by isotope-dilution TIMS+MC-ICPMS – Preliminary Results. AGU Fall Meeting, San Francisco, California.
- Ickert R.B.**, Mundil R., Magee C.W., 2014. U-Th-Pb systematics of the Bishop Tuff zircon. Goldschmidt 2014.
- Ickert R.B.**, Renne P.R., Deino A.L., Sharp W.D., 2014. Rapid and precise Pb isotope analysis of K-feldspar: A new tool for tephrochronology. Goldschmidt 2014.
- Mundil R.**, Irmis R.B., **Ickert R.B.**, 2014. Integrated Chronostratigraphy from outcrop and drill core samples (Late Triassic, Colorado Plateau). Goldschmidt 2014.
- Ickert R.B.**, Magee C.W., Mundil R., 2013. SIMS and TIMS U-Th-Pb geochronology of zircon from the Bishop Tuff. AGU Fall Meeting.
- Ickert R.B.**, Mundil R. 2013. Alternative approaches to evaluating geochemical data: Beyond the weighted-mean. William Smith Meeting 2013: The first century of isotope geochronology. London.
- Mundil R., Irmis R. B., **Ickert R.B.**, 2013. Understanding the early Mesozoic world: New geochronological data from terrestrial and marine strata. EGU General Assembly, Vienna.
- Ickert R.B.**, and Mundil R., 2012. An objective method to determine the probability distribution of the minimum apparent age of a sample of radio-isotopic dates. AGU Fall Meeting, San Francisco, California.