

## CCIM Publications

### 2014

Partin, C. A., Bekker, A., Sylvester, P. J., Wodicka, N., Stern, R. A., Chacko, T., and Heaman, L. M., 2014. Filling in the juvenile magmatic gap: Evidence for uninterrupted Paleoproterozoic plate tectonics. *Earth Planet. Sci. Lett.* **388**, 123-133.

Smit, K. V., Stachel, T., Creaser, R. A., Ickert, R. B., DuFrane, S. A., Stern, R. A., and Seller, M., 2014. Origin of eclogite and pyroxenite xenoliths from the Victor kimberlite, Canada, and implications for Superior craton formation. *Geochim. Cosmochim. Acta* **125**, 308-337. <http://dx.doi.org/10.1016/j.gca.2013.10.019>

Smit, K. V., Stachel, T., and Stern, R. A., 2014. Diamonds in the Attawapiskat area of the Superior craton (Canada): evidence for a major diamond-forming event younger than 1.1 Ga. *Contrib. Mineral. Petrol.* **167**. doi: 10.1007/s00410-013-0962-6

Zeh, A., Stern, R. A., and Gerdes, A., 2014. The oldest zircons of Africa - Their U-Pb-Hf-O isotope and trace element systematics, and implications for Hadean to Archean crust-mantle evolution. *Precambrian Res.* **241**, 203-230.

### 2013

Pecoits, E., Konhauser, K. O., Aubet, N. R., Heaman, L. M., Veroslavsky, G., Stern, R. A., and Gingras, M. K., 2013. Response to comment on "Bilaterian Burrows and Grazing Behavior at >585 Million Years Ago". *Science* **339**, 1693-1696.

Melton, G. L., Stachel, T., Stern, R. A., Carlson, J., and Harris, J. W., 2013. Infrared spectral and carbon isotopic characteristics of micro- and macro-diamonds from the Panda kimberlite (Central Slave Craton, Canada). *Lithos* **177**, 110-119.

Howell, D., Griffin, W. L., Piazolo, S., Say, J. M., Stern, R. A., Stachel, T., Nasdala, L., Rabeau, J. R., Pearson, N. J., O'Reilly, R. Y. (2013). A spectroscopic and carbon-isotope study of mixed-habit diamonds: Impurity characteristics and growth environment. *American Mineralogist*, 98, 66-77.

Ickert, R. B., Stachel, T., Stern, R. A., Harris, J. W. (2013). Diamond from recycled crustal carbon documented by coupled d18O–d13C measurements of diamonds and their inclusions. *Earth and Planetary Science Letters*, 364, 85-97.

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*. doi: 10.1111/j.1751-908X.2013.00222.x

Palot, M., Pearson, D. G., Stern, R. A., Stachel, T., Harris, J. W. (2013). Multiple growth events, processes and fluid sources involved in diamond genesis: A micro-analytical study of sulphide-bearing diamonds from Finsch mine, RSA. *Geochimica et Cosmochimica Acta*, 106, 51-70.

## 2012

Chen, H., Qiu, Z., Lu, T., Stern, R. A., Stachel, T., Sun, Y., Zhang, J., Ke, J., Peng, S., Qin, S. (2012). Variations in carbon isotope composition in the subcontinental lithospheric mantle beneath the Yangtze and North China Cratons: Evidence from in-situ analysis of diamonds using SIMS. *Chinese Science Bulletin*, 58 (1), 99-107.

Darling, J., Moser, D., Heaman, L., Davis, W., Stern, R., O'Neil, J., Carlson, R., Francis, D. (2012). *Zircon U-Pb geochronology of the Nuvvuagittuq Greenstone Belt*. Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Howell, D., O'Neil, C. J., Grant, K. J., Griffin, W. L., O'Reilly, S. Y., Pearson, N. J., Stern, R. A., Stachel, T. (2012). Platelet development in cuboid diamonds: insights from micro-FTIR mapping. *Contributions to Mineralogy and Petrology*, 164, 1011-1025.

Hunt, L., Stachel, T., Pearson, D. G., Stern, R. A., Muehlenbachs, K., McLean, H., Marcheggiani-Croden, V. (2012). *Polycrystalline fibrous diamonds from the Diavik diamond mine, Canada*. Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Hunt, L., Stachel, T., Pearson, D. G., Stern, R. A., Muehlenbachs, K., Marcheggiani-Croden, V., McLean, H. (2012). *Non-gem diamonds from the Diavik diamond mine, Canada: tracers for cratonic mantle metasomatism*. Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Jacob, D. E., Czas, J., Reutter, M., Stachel, T., Stern, R. A. (2012). *Geochemistry of polycrystalline diamonds with peridotitic and eclogitic inclusion suites from the Venetia Mine, RSA*. Paper presented at the 63<sup>rd</sup> De Beers Diamond Conference, Warwick, United Kingdom.

Johnson, C. N., Stachel, T., Muehlenbachs, K., Stern, R. A., Armstrong, J. P., EIMF. (2012). The micro-/macro-diamond relationship: a case study from the Artemisia kimberlite (Northern Slave Craton, Canada). *Lithos*, 148, 86-97.

Ickert, R. B., Stachel, T., Stern, R. A., Harris, J. W. (2012). *Diamond growth from organic carbon suggested by coupled d18O-d13C variations in diamonds and garnet inclusions.* Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Lu, T., Chen, H., Qiu, Z., Zhang, J., Wei, R., Ke, J., Sunagawa, I., Stern, R. A., Stachel, T. (2012). Multiple core growth structure and nitrogen abundances of diamond crystals from Shandong and Liaoning kimberlite pipes, China. *European Journal of Mineralogy*, 24 (4), 651-656.

Miskovic, A., Ickert, R. B., Pearson, D. G., Stern, R. A., Kopylova, M., Kjarsgaard, B. (2012). *Global oxygen isotope survey of lithospheric mantle: Implications for the evolution of cratonic roots.* Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Palot, M., Pearson, D. G., Stern, R. A., Stachel, T. (2012). *Nature of fluids in the deep mantle (>300km) inferred from a carbon and nitrogen micro-analytical study of a single ultra-deep diamond from Kankan, Guinea.* Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Palot, M., Pearson, D. G., Stern, R. A., Stachel, T., Harris, J. W. (2012). *Multiple growth events, processes and fluid sources involved in the growth of diamonds from Finsch mine, RSA: a micro-analytical study.* Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Peats, J., Stachel, T., Stern, R. A., Muehlenbachs, K., Armstrong, J. (2012). Aviat diamonds: a window into the deep lithospheric mantle beneath the northern Churchill Province. *Canadian Mineralogist*, 50, 611-624.

Pecoits, E., Konhauser, K. O., Aubet, N. R., Heaman, L. M., Veroslavsky, G., Stern, R. A., Gingras, M. K. (2012). Bilaterian burrows and grazing behavior at > 585 million years ago. *Science*, 336 (6089), 1693-1696.

Riches, A. J. V., Pearson, D. G., Stern, R. A., Ickert, R. B., Jackson, S. E., Ishikawa, A., Kjarsgaard, B. A. (2012). *Metasomatism of a Roberts Victor eclogite linked to the formation and destruction of diamond.* Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Rubanova, E. V., Griffin, W. L., Piazolo, S., O'Reilly, S. Y., Stachel, T., Stern, R. A., Birnie, A. C. (2012). *Geochemistry and microstructure of diamondites.* Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Saso, J. K., Al, T. A., Clark, I. D., Stern, R. A. (2012). *A strontium, carbon and oxygen isotopic investigation of secondary carbonate minerals in Ordovician rocks from the*

*Michigan Basin in southwestern Ontario.* Paper presented at the 11th Annual Nuclear Waste Management Organization Geoscience Seminar, Blue Mountain, Canada.

Smart, K. A., Chacko, T., Stachel, T., Tappe, S., Muehlenbachs, K., Ickert, R. B., Stern, R. A. (2012). *Jericho diamond eclogite formation revealed by diamond inclusions: oceanic origin without crustal signature?* Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Smart, K. A., Chacko, T., Stachel, T., Tappe, S., Stern, R. A., Ickert, R. B., EIMF. Eclogite formation beneath the northern Slave craton constrained by diamond inclusions: Oceanic lithosphere origin without a crustal signature. *Earth and Planetary Science Letters*, 319-320, 165-177.

Smit, K. V., Stachel, T., Creaser, R. A., Dufrane, S. A., Ickert, R. B., Stern, R. A., Seller, M. (2012). *Formation of eclogites and pyroxenites below Attawapiskat, Superior Craton (Canada).* Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

Smit, K. V., Stachel, T., Seller, M. (2012). *Constraints on the composition of possible diamond bearing lithosphere as sampled by the Victor kimberlite.* Paper presented at the 10<sup>th</sup> International Kimberlite Conference, Bangalore, India.

Zeh, A., Gerdes, A., Stern, R. A. (2012). *Zircon alteration in Archean orthogneisses: Insights from U-Pb-Hf-O isotopes and trace elements.* Paper presented at the 22<sup>nd</sup> V. M. Goldschmidt Conference, Montreal, Canada.

## **2011**

Blinova, A. I., Stern, R. A., Herd, C. D. K. (2011). *In situ SIMS oxygen isotope measurements of zoned olivines in the Tagish Lake meteorite chondrules.* Paper presented at the 74<sup>th</sup> Annual Meeting of the Meteoritical Society, London, United Kingdom.

Ickert, R. B., Stachel, T., Harris, J. W. (2011). *Diamond growth from subducted carbon implied by correlated  $\delta^{18}\text{O}$ - $\delta^{13}\text{C}$  variations in diamonds and garnet inclusions.* Paper presented at the American Geophysical Union Fall Meeting 2011, San Francisco, United States of America.

Ickert, R. B., Stern, R. A., Stachel, T., Harris, J. W. (2011). *Diamonds from the sea floor: SIMS oxygen isotope data from eclogitic garnet inclusions in diamonds from the Damtshaa kimberlites (Botswana) and Argyle lamproite (Australia).* Paper presented at the Geological Association of Canada Annual Meeting, Ottawa, Canada.

Johnson, C., Stachel, T., Stern, R. A., Armstrong, J. (2011). *The micro-/macro-diamond relationship – a new SIMS approach to an old question*. Paper presented at the 62<sup>nd</sup> Diamond Conference, Warwick, United Kingdom.

Miskovic, A., Ickert, R. B., Pearson, D. G., Stern, R. A. (2011). *Oxygen isotope survey of the northern Canadian lithospheric mantle: Implications for the evolution of cratonic roots*. Paper presented at the 39<sup>th</sup> Annual Yellowknife Geosciences Forum, Yellowknife, Canada.

Peats, J., Stachel, T., Stern, R. A., Muehlenbachs, K., Armstrong, J. (2011). *Aviat Diamonds: A window into the deep lithospheric mantle beneath the northern Churchill Province*. Paper presented at the Geological Association of Canada Annual Meeting 2011, Ottawa, Canada.

Smart, K. A., Chacko, T., Stachel, T., Muehlenbachs, K., Stern, R. A., Heaman, L. M. (2011). Diamond growth from oxidized carbon sources beneath the Northern Slave Craton, Canada: A  $\delta^{13}\text{C}$ -N study of eclogite-hosted diamonds from the Jericho kimberlite. *Geochimica et Cosmochimica Acta*, 75 (20), 6027-6047.

Smart, K. A., Chacko, T., Stachel, T., Stern, R. A., Muehlenbachs, K. (2011). *Formation of diamond from oxidized fluids/melts: d13C-N SIMS study of an eclogitic diamond from the Jericho kimberlite, Canada*. Paper presented at the 21<sup>st</sup> V. M. Goldschmidt Conference, Prague, Czech Republic.

Stern, R. A. (2011). Earth Sciences, Isotope Ratios, Sensitive High-Resolution Ion Microprobe. In D. Beauchemin and D. E. Matthews (Ed.), *The Encyclopedia of Mass Spectrometry, Volume 5: Elemental and Isotope Ratio Mass Spectrometry*, Amsterdam, Elsevier.

Stern, R. A., Palot, M., Stachel, T., Pearson, D. G., Cartigny, P. (2011). *Progress in SIMS analysis of C- and N-isotopes in diamond*. Paper presented at the 6th Biennial Geochemical SIMS Workshop (BGSW6), Honolulu, Hawaii.

Zeh, A., Gerdes, A., Stern, R. A. (2011). *Formation and alteration of zircons in Archaean granitoids from Swaziland: Combined insights from CL-imaging, trace element,  $\delta^{18}\text{O}$ , U-Th-Pb and Lu-Hf isotope analyses*. Paper presented at the German Mineralogical Society Annual Meeting, Salzburg, Austria.

## 2010

Blinova, A., Herd, C. D. K. (2010). *Insights into the mineralogy of the Tagish Lake meteorite through EPMA, XRD and CL*. Paper presented at the 41<sup>st</sup> Lunar and Planetary Science Conference, The Woodlands, United States of America.

Blinova, A., Herd, C. D. K., Stern, R. A., Matveev, S. (2010). *XRD, EPMA and CL study of the lithologies within the Tagish Lake meteorite*. Paper presented at the GeoCanada 2010, Calgary, Canada.

Davies, J. H. F. L., Heaman, L. M., Stern, R. A. (2010). *Using Intra-grain variations in oxygen isotope composition and CL imaging to understand U-Pb discordance in baddeleyite*. Paper presented at the Geological Society of America Annual Meeting, Denver, United States of America.

Herd, C. D. K., Stern, R. A., Walton, E. L., Li, J., Bibby, C. (2010). *TEM and SEM-CL Analysis of Baddeleyite in NWA 3171: Geochronological Implications for Martian Meteorites*. Paper presented at the 41<sup>st</sup> Lunar and Planetary Science Conference, The Woodlands, United States of America.

Ickert, R. B., Stern, R. A., Stachel, T. (2010). MC-HR-SIMS oxygen isotope analysis of ferropericlaste inclusions in diamond. *Geochimica et Cosmochimica Acta*, 74 (11), A442.

Johnson, C. N., Stern, R. A., Stachel, T., Muehlenbachs, K., Armstrong, J. (2010). *The micro-/macro-diamond relationship: A case study from the Artemisia kimberlite northern Slave Craton (Nunavut, Canada)*. Paper presented at the 38<sup>th</sup> Annual Yellowknife Geoscience Forum, Yellowknife, Canada.

Peats, J., Stachel, T., Stern, R. A., Muehlenbachs, K., Armstrong, J. (2010). *Aviat diamonds as a window into the deep lithospheric mantle beneath the Northern Churchill Province*. Paper presented at the 38<sup>th</sup> Annual Yellowknife Geoscience Forum, Yellowknife, Canada.

Smart, K. A., Stern, R. A., Heaman, L. M., Chacko, T., Stachel, T., Muehlenbachs, K. (2010). *13C-depleted diamonds in eclogites: diamond growth constraints from SIMS*. Paper presented at the 61<sup>st</sup> Diamond Conference, Warwick, United Kingdom.

Smart, K. A., Chacko, T., Heaman, L. M., Stachel, T., Muehlenbachs, K. (2010). *13C depleted diamonds in Jericho eclogites: Diamond formation from ancient subducted organic matter*. Paper presented at the 20<sup>th</sup> V. M. Goldschmidt Conference, Knoxville, United States of America.

Stern, R. A., Ickert, R. B. (2010). Zircon oxygen isotopes by SIMS: Performance evaluation of the Canadian IMS1280. *Geochimica et Cosmochimica Acta*, 74 (11), A993.

## 2009

Stern, R. A. (2009). An introduction to secondary ion mass spectrometry (SIMS) in geology. In M. Fayek (Ed.), *Secondary Ion Mass Spectrometry in the Earth Sciences*:

*Gleaning the Big Picture from a Small Spot*, Québec, Mineralogical Association of Canada.