

Curriculum Vitae – Kristoffer Szilas

Bio data

Full name: Kristoffer Szilas
Year of birth: 1982 in Copenhagen, Denmark
Nationality: Danish
Marital status: Married, one child (2015)
Leave: 3 months of parental leave in 2015
Work address: GEUS, Øster Voldgade 10, 1350 Copenhagen, Denmark
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Education

2012 Ph.D. Geology. University of Copenhagen. Thesis titled: ‘Geochemistry of Archaean supracrustal belts in SW Greenland’. Supervised by Professor Minik T. Rosing, Professor Robert Frei, Anders Scherstén and Thomas F. Kokfelt.
2008 M.Sc. Geology. University of Copenhagen. Thesis on the Archaean Storø gold deposit in SW Greenland.
2006 B.Sc. Geology. University of Copenhagen. Graduation project on porphyry copper deposits.

Academic career

2017-present Postdoc at the Geological Survey of Denmark and Greenland (GEUS).
2014-2016 (December 7th) Postdoc/visiting scholar at Stanford University, California, USA. Collaboration with Professor Dennis Bird on the petrogenesis of the Archaean Seqi Olivine Mine of SW Greenland.
2012-2014 Postdoctoral research fellow at Lamont-Doherty Earth Observatory, Columbia University, New York, USA. Collaboration with Professor Peter Kelemen on the origin of ultramafic rocks in the 3.7 Ga Isua supracrustal belt.

Research interests

The geology of Greenland, geodynamic settings of Archaean supracrustal belts, origins of Archaean serpentinites, growth mechanisms of metamorphic pseudo-spinifex textures, petrogenesis of andesites, mass-balance calculations on alteration zones, platinum-group element (PGE) systematics, Archaean peridotites and the formation of cratons.

Grants and funding

2016 Carlsberg Foundation: ~100,000 USD for postdoctoral research at GEUS on the Fiskefjord peridotites.
2016 Dr. Phil Ragna Rask-Nielsens Grundforskningsfond: ~3,000 USD to conduct fieldwork in Greenland in 2017.
2015 Niels Bohr Foundation: ~1,500 USD research grant to study peridotites from Greenland.
2014 Carlsberg Foundation: ~10,000 USD to conduct fieldwork at Ulamertoq in SW Greenland.
2014 Julie von Müllen Foundation: ~3,000 USD to conduct fieldwork in SW Greenland.
2013 Royal Danish Academy of Sciences and Letters: ~5,000 USD to conduct fieldwork in SW Greenland.
2013 Villum Foundation (VKR): ~160,000 USD for research about the Seqi dunite body in SW Greenland.
2012 Knud Højgaard Foundation: ~4,000 USD to conduct fieldwork at Seqi in SW Greenland.
2012 Danish Council for Independent Research (FNU): ~275,000 USD for research on Archaean serpentinites.

Total research funding received: ~560,000.00 USD

N.B. all of the above grants were obtained by myself as the principal investigator and based on my own research ideas.

Field work

2016 Five weeks of fieldwork for the Ministry of Mineral Resources (MMR) in the Maniitsoq region, SW Greenland.
2013-2015 Three weeks of fieldwork on peridotites in the Fiskefjord-region, SW Greenland.
2014 Four weeks of fieldwork with GEUS in Tasiilaq-region of South-East Greenland.
2013 Ten day field trip led by Professor Peter B. Kelemen to the Oman ophiolite, Oman.
2010 One week field trip led by Arthur H. Hickman to the West Pilbara craton, Australia.
2009-2010 Nine weeks of fieldwork with the Geological Survey of Denmark and Greenland (GEUS), SW Greenland.
2009 One week field trip on Archaean geology and habitats for early life near Mekrijärvi, Finland.
2009 One week field course with mapping of alterations in porphyry copper deposits, Nevada, USA.
2006-2008 17 weeks of fieldwork during the summers for NunaMinerals A/S in Godthåbsfjord, SW Greenland.
2005 Hard rock/endogene field course in Bygland, Norway.
2004 Structural field course at Mors, Denmark.

Total time spent carrying out fieldwork in Greenland: ~9 months

Scientific service

Session convenor at the Goldschmidt Conference. Reviewer for: ‘Geology’; ‘Precambrian Research’; ‘Chemical Geology’; ‘Lithos’; ‘Gondwana Research’; ‘Mineralogical Magazine’; ‘Tectonophysics’; ‘Geological Society London Special Publications’; ‘Earth, Planets and Space’; ‘Physical Sciences Research International’; Finnish Ph.D. thesis; NERC grant and NSF grant.

Analytical experience

Clean lab procedures, fluid chemistry, rock digestion and chromatographic element separation.

Trace element measurements by ICP-MS.

Isotope measurements of Sm-Nd (TIMS), Re-Os (N-TIMS), Lu-Hf and Sm-Nd (MC-ICP-MS).

In situ U-Pb isotope zircon dating by LA-ICP-MS.

Polarized light microscopy, SEM and EMPA imaging and characterisation of minerals in thin section.

International relations

I have had the opportunity of working at several internationally recognised laboratories during my research career, which have resulted in several collaborative publications:

- Stanford University, California (USA) with Professor Dennis Bird, who wrote the textbook on geochemistry that inspired me to pursue this line of research. I mainly work with the electron microprobe at Stanford.
- Lund University (Sweden) guest researcher during the summer of 2015.
- Columbia University, New York (USA) with Professor Peter Kelemen, who is an expert on mantle petrology. There I worked with the electron microprobe and ICP-MS trace element analysis during my postdoc.
- University of Bonn (Germany) with Professor Carsten Münker, who is the leading specialist on high-field-strength element systematics and also has facilities for Sm-Nd and Lu-Hf isotope analysis. I worked in his laboratory with the two latter isotope systems during my Ph.D. research.
- University of Alberta, Edmonton (Canada) with Professor Robert Creaser who is a leading Re-Os isotope specialist. He introduced me to the carius tube method of Re-Os analysis during my Ph.D. research.

Furthermore, I have had the pleasure of collaborating closely with D. Graham Pearson at University of Alberta (Canada), Vincent J. van Hinsberg at McGill University (Canada), J. Elis Hoffmann University of Berlin (Germany), and Alex F.M. Kisters at University of Stellenbosch (South Africa).

Workshop and short-course attendances

2015 Short-course by James Day titled 'Highly siderophile and strongly chalcophile elements in high temperature geochemistry and cosmochemistry', San Diego, USA.

2010 Fifth International Archean Symposium in Perth, Australia.

2009 Short-course by Roger Powell on the applications of Thermocalc in metamorphic petrology, Prague.

2009 Workshop titled 'Archaean environment: the habitat of early life' in Mekrijärvi, Finland.

2008 Short-course on VMS mineral deposits by Mark Hannington in Turku, Finland.

2007 Short-course on epithermal mineral deposits by Jeffrey W. Hedenquist in Turku, Finland.

Invited talks

2015 Archaean geochemistry of SW Greenland. Lund University, Sweden.

2015 Geology of the Archaean craton of SW Greenland. San Jose University, USA.

2014 Archaean geochemistry of SW Greenland – Implications for geodynamics. Stanford University, USA.

2013 Petrogenesis of andesites in Mesoarchaean supracrustal belts of SW Greenland: geodynamic implications. University of Colorado at Boulder, USA.

Reports, comments and teaching material

Szilas, K., Hoffmann, J.E., Münker, C., Dziggel, A. & Rosing, M.T. (2014). Eoarchean within-plate basalts from southwest Greenland: Comment. *Geology* 42, e330.

Szilas, K., van Hinsberg, V.J., Kisters, A.F.M., Kokfelt, T.F., Scherstén, A. & Windley, B.F. (2011). Remnants of Mesoarchaean oceanic crust in the Tartoq Group, South-West Greenland. *Geological Survey of Denmark and Greenland Bulletin* 23, 57-60.

Szilas, K., Berger, A., Kokfelt, T.F., Næraa, T. & Scherstén, A. (2011). Geochemistry of the Supracrustal rocks and the associated intrusive TTG suites of the Archaean craton in South-West and southern West Greenland. *Danmarks og Grønlands Geologiske Undersøgelse Rapport* 2011/10, 134 pp.

Szilas, K., Kokfelt, T.F., Næraa, T. & Scherstén, A. (2011). Geochemistry of Archaean felsic crust in SW Greenland. In: Kokfelt, T.F. (ed.), *Geochemistry of supracrustal rocks and associated intrusive TTG suites of the Archaean craton in South-West Greenland and southern West Greenland, 61°30' - 64°N*. *Danmarks og Grønlands Geologiske Undersøgelse Rapport* 2011/10.

Kisters, A.F.M., **Szilas, K.** & van Hinsberg, V.J. (2011). Structural geology and emplacement of the Tartoq Group, SW Greenland. In: Kolb, J. (ed.), *Controls of hydrothermal quartz vein mineralisation and wall rock alteration in the Paamiut and Tartoq areas, South-West Greenland*. *Danmarks og Grønlands Geologiske Undersøgelse Rapport* 2011/114, 116-147.

Mojzsis, S.J., Hanski, E., Maier, W.D. & **Szilas, K.**, O'Brian, H. (2011). Short course notes on Archaean geology. Oulu University, Finland. 150 pp.

van Hinsberg, V.J., **Szilas, K.** & Kisters, A.F.M. (2010). The Tartoq Group, SW Greenland: Mineralogy, textures and a preliminary metamorphic to hydrothermal history. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2010/120, 52 pp.

Knudsen, C., van Gool, J.A.M., Østergaard, C., Hollis, J.A., Rink-Jørgensen, M., Persson, M. & **Szilas, K.** (2007). Gold-hosting supracrustal rocks on Storø, southern West Greenland: lithologies and geological environment. Geological Survey of Denmark and Greenland Bulletin 13, 41-44.

Conference abstracts

Szilas, K., Cruz, M., Grove, M., Morishita, T. & Pearson, D.G. (2016). Metasomatic processes in the orthogneiss-hosted Archaean peridotites of the Fiskefjord region, SW Greenland. Geophysical Union Conference, San Francisco.

Cruz, M., Grove, M. & **Szilas, K.** (2016). Relative Diffusion of Argon and Calcium in Mica and Implications for K-Ca Dating Methods. American Geophysical Union Conference, San Francisco.

Szilas, K., Morishita, T. & Pearson, D.G. (2016). Peridotite complexes hosted by Mesoarchaeoan orthogneiss in SW Greenland - Potential implications for the formation of the North Atlantic Craton. Magma Chamber Process Meeting XIX, Copenhagen.

Szilas, K., van Hinsberg, V.J., McDonald, I., Morishita, T. & Pearson, D.G. (2016). Highly depleted peridotites within Mesoarchaeoan orthogneiss at the Seqi Olivine Mine, SW Greenland - Potential implications for the formation of cratonic keels. Goldschmidt Conference, Yokohama.

Peters, S.T.M., Pack, A., Zeuner, M., **Szilas, K.** & Hering, M. (2016). Triple oxygen isotope compositions of the ~3.0 Ga Fiskefjord peridotites, SW Greenland. Goldschmidt Conference, Yokohama.

Pearson, D.G., Wang, H., van Hunen, J. **Szilas, K.** (2016). Making the complex mantle keels beneath cratons. Goldschmidt Conference, Yokohama.

Szilas, K., Kelemen, P.B. & Bernstein, S. (2015). Origins of Large Peridotite Bodies within Mesoarchean Orthogneisses in SW Greenland. American Geophysical Union Conference, San Francisco.

Cruz, M., Grove, M. & **Szilas, K.** (2015). Comparison of Ca and Ar Diffusion in Phlogopite: Implications for K-Ca and K-Ar Geochronology. American Geophysical Union Conference, San Francisco.

Szilas, K., Tusch, J., Hoffmann, J.E. & Münker, C. (2015). Mesoarchaeoan andesites in SW Greenland – Evidence for Archaean subduction zones? Goldschmidt Conference, Prague.

Klausen, M.B., Kokfelt, T.F. & **Szilas, K.** (2015). A geochemical profile through the Mesoarchaeoan Nigerrilikasik tholeiitic to calc-alkaline metavolcanic sequence, South-West Greenland. Goldschmidt Conference, Prague.

Szilas, K., Kelemen, P.B. & Rosing, M.T. (2014). The petrogenesis of ultramafic rocks in the >3.7 Ga Isua supracrustal belt, southern West Greenland. American Geophysical Union Conference, San Francisco.

Szilas, K., van Hinsberg, V.J. & Creaser, R. (2014). The geochemical composition of serpentinites in the Mesoarchaeoan Tartoq Group, SW Greenland: Harzburgitic cumulate or melt-modified mantle? Goldschmidt Conference, Sacramento.

Szilas, K. (2014). The geochemical composition of Archaean ultramafic, mafic and andesitic rocks of supracrustal and intrusive origins, SW Greenland - Geodynamic implications. The North Atlantic Craton Conference, St. Andrews.

Szilas, K. & Hoffmann, J.E. (2013). Petrogenesis of andesites in Mesoarchaeoan supracrustal belts of SW Greenland: geodynamic implications. Goldschmidt Conference, Florence.

Szilas, K., Hoffmann, J.E. & Scherstén, A. (2012). Complex calc-alkaline volcanism recorded in Mesoarchaeoan supracrustal belts in SW Greenland. Goldschmidt Conference, Montréal.

Szilas, K., van Hinsberg, V. J. & Kisters, A. (2011). The Mesoarchaeoan Tartoq Group suprasubduction zone ophiolite, SW Greenland. AGU Fall Meeting Abstracts Vol. 1, p. 2498.

Szilas, K., van Hinsberg, V.J. & Kisters, A.F.M. (2011). Mesoarchaeoan suprasubduction zone ophiolite in the Tartoq Group, SW Greenland. Goldschmidt Conference, Prague.

van Hinsberg, V.J., **Szilas, K.** & Wood, B. (2011). Towards a Quantitative Record of Archaean Ocean Water Chemistry: An Element Partitioning Approach Goldschmidt Conference, Prague.

Szilas, K., Garde, A.A., Scherstén, A., van Gool, J.A.M. & Østergaard, C. (2011). Mesoarchaean premetamorphic hydrothermal alteration of tholeiitic basalt resulting in aluminous lithologies, Storø supracrustal belt, Nuuk region, southern West Greenland. *Geophysical Research Abstracts*, vol. 13, EGU2011-12125-1.

Szilas, K., Scherstén, A., Hoffmann, J.E., Kokfelt, T.F., van Hinsberg, V.J., Windley, B.F. & Münker, C. (2011). Linking the Ravens Storø and Bjørnesund supracrustal belts (SW Greenland) using Lu-Hf and Sm-Nd isotopic data and whole-rock geochemistry. *Geophysical Research Abstracts*, vol. 13, EGU2011-11114-1.

Szilas, K., van Hinsberg, V.J., Kisters, A.F.M., Kokfelt, T.F., Scherstén, A. & Windley, B.F. (2011). Remnants of Mesoarchaean oceanic crust in the Tartoq Group, North Atlantic Craton, SW Greenland. *Geophysical Research Abstracts*, vol. 13, EGU2011-3170-2.

Keulen, N., Schumacher, J.C., van Hinsberg, V.J., **Szilas, K.**, Windley, B.F., Kokfelt, T.F., Schlatter, D.M., & Scherstén, A. (2011). The Bjørnesund anorthosite-greenstone belt - a link between the Fiskeneset complex and the Ravens Storø metavolcanic belt, southern West Greenland. *Geophysical Research Abstracts*, vol. 13, EGU2011-8525-1.

Publications in international peer-reviewed journals

- 17) **Szilas, K.**, Tusch, J., Hoffmann, J.E., Garde, A.A. & Münker, C. (2016). Hafnium isotope constraints on the origin of Mesoarchaean andesites in southern West Greenland, North Atlantic craton. In: Halla, J., Whitehouse, M. J., Ahmad, T. & Bagai, Z. (eds.) *Crust–Mantle Interactions and Granitoid Diversification: Insights from Archaean Cratons*. Geological Society, London, Special Publications, 449 (in press).
<http://dx.doi.org/10.1144/SP449.2>
- 16) **Szilas, K.**, Hoffmann, J.E., Schulz T., Hansmeier, C., Polat, A., Viehmann, S., Kasper, H.U. & Münker, C. (2016). Combined bulk-rock Hf- and Nd-isotope compositions of Mesoarchaean metavolcanic rocks from the Ivisaartoq Supracrustal Belt, SW Greenland: Deviations from the mantle array caused by crustal recycling. *Chemie der Erde* 76, 543-554.
<http://dx.doi.org/10.1016/j.chemer.2016.09.004>
- 15) **Szilas, K.**, Maher, K. & Bird, D. (2016). Aluminous gneiss derived by weathering of basaltic source rocks in the Neoproterozoic Storø Supracrustal Belt, southern West Greenland. *Chemical Geology* 441, 63-80.
<http://dx.doi.org/10.1016/j.chemgeo.2016.08.013>
- 14) **Szilas, K.**, Hoffmann, J.E., Hansmeier, C., Hollis, J.A., Münker, C., Viehmann, S. & Kasper, H.U. (2015). Sm-Nd and Lu-Hf isotope and trace-element systematics of Mesoarchaean amphibolites, inner Ameralik fjord, southern West Greenland. *Mineralogical Magazine* 79, 857-876.
<http://dx.doi.org/10.1180/minmag.2015.079.4.02>
- 13) **Szilas, K.**, Kelemen, P.B. & Rosing, M.T. (2015). The petrogenesis of ultramafic rocks in the >3.7 Ga Isua supracrustal belt, southern West Greenland: Geochemical evidence for two distinct magmatic cumulate trends. *Gondwana Research* 28, 565-580.
<http://dx.doi.org/10.1016/j.gr.2014.07.010>
- 12) **Szilas, K.**, Kelemen, P.B. & Bernstein, S. (2015). Peridotite enclaves hosted by Mesoarchaean TTG-suite orthogneisses in the Fiskefjord region of southern West Greenland. *GeoResJ* 7, 22-34.
<http://dx.doi.org/10.1016/j.gr.2014.07.010>
- 11) Keulen, N., Schumacher, J.C., Næraa, T., Kokfelt, T.F., Scherstén, A., **Szilas, K.**, van Hinsberg, V.J., Schlatter, D.M. & Windley, B.F. (2014). Meso- and Neoproterozoic geological history of the Bjørnesund and Ravens Storø Supracrustal Belts, southern West Greenland: settings for gold enrichment and corundum formation. *Precambrian Research* 254, 36-58.
<http://dx.doi.org/10.1016/j.precamres.2014.07.023>
- 10) **Szilas, K.**, van Gool, J.A.M., Scherstén, A. & Frei, R. (2014). The Neoproterozoic 'Storø Supracrustal Belt', Nuuk region, southern West Greenland: An arc-related basin with continent-derived sedimentation. *Precambrian Research* 247, 208-222.
<http://dx.doi.org/10.1016/j.precamres.2014.04.010>
- 9) **Szilas, K.**, van Hinsberg, V.J., Creaser, R.A. & Kisters, A.F.M. (2014). The geochemical composition of serpentinites in the Mesoarchaean Tartoq Group, SW Greenland: Harzburgitic cumulates or melt-modified mantle? *Lithos* 198-199, 103-116.
<http://dx.doi.org/10.1016/j.lithos.2014.03.024>
- 8) **Szilas, K.**, Hoffmann, J.E., Scherstén, A., Kokfelt, T.F. & Münker, C. (2013). Archaean andesite petrogenesis: Insights from the Grædefjord Supracrustal Belt, southern West Greenland. *Precambrian Research* 236, 1-15.
<http://dx.doi.org/10.1016/j.precamres.2013.07.013>

- 7) **Szilas, K.** & Garde, A.A. (2013). Mesoarchaeoan aluminous rocks at Storø, southern West Greenland: New age data and evidence of premetamorphic seafloor weathering of basalts. *Chemical Geology* 354, 124-138.
<http://dx.doi.org/10.1016/j.chemgeo.2013.07.001>
- 6) Bernstein, S., **Szilas, K.** & Kelemen, P.B. (2013). Highly depleted cratonic mantle in West Greenland extending into diamond stability field in the Proterozoic. *Lithos* 168-169, 160-172.
<http://dx.doi.org/10.1016/j.lithos.2013.02.011>
- 5) **Szilas, K.**, van Hinsberg, J., Kisters, A.F.M., J. Hoffmann, E., Windley, B.F., Kokfelt, T.F., Scherstén, A., Frei, R., Rosing, M.T. & Münker, C. (2013). Remnants of arc-related Mesoarchaeoan oceanic crust in the Tartoq Group, SW Greenland. *Gondwana Research* 23, 436-451.
<http://dx.doi.org/10.1016/j.gr.2011.11.006>
- 4) Kisters, A.F.M., van Hinsberg, V.J. & **Szilas, K.** (2012). Geology of an Archaean accretionary complex – the structural record of burial and return flow in the Tartoq Group of South West Greenland. *Precambrian Research* 220-221, 107-122.
<http://dx.doi.org/10.1016/j.precamres.2012.07.008>
- 3) **Szilas, K.**, Hoffmann, J.E., Scherstén, A., Rosing, M.T., Kokfelt, T.F., Windley, B.F., van Hinsberg, V.J., Næraa, T., Keulen, N., Frei, R. & Münker, C. (2012). Complex calc-alkaline volcanism recorded in Mesoarchaeoan supracrustal belts north of Frederikshåb Isblink, southern West Greenland: Implications for subduction zone processes in the early Earth. *Precambrian Research* 208-211, 90-123.
<http://dx.doi.org/10.1016/j.precamres.2012.03.013>
- 2) **Szilas, K.**, Næraa, T., Scherstén, A., Stendal, H., V.J., Frei, R., van Hinsberg, V.J., Kokfelt, T.F. & Rosing, M.T. (2012). Origin of Mesoarchaeoan arc related rocks with boninite/komatiite affinities from southern West Greenland. *Lithos* 144-145, 24-39.
<http://dx.doi.org/10.1016/j.lithos.2012.03.023>
- 1) Scherstén, A., **Szilas, K.**, Creaser, R.A., Næraa, T., van Gool, J.A.M. & Østergaard, C. (2012). Re-Os and U-Pb constraints on gold mineralisation events in the Meso- to Neoarchaeoan Storø greenstone belt, Storø, southern West Greenland. *Precambrian Research* 200-203, 149-162.
<http://dx.doi.org/10.1016/j.precamres.2011.12.014>

Areas in SW Greenland that I have studied since 2006:

