

LITHOSPHERE 2021 Symposium Programme

Tuesday, Jan 19

(All times are Helsinki time, EET = GMT+2 h)

10:00 - 10:05 Opening: I. Kukkonen, Chair of the Finnish National ILP Committee

10:05 – 10:10 Address: H. Thybo, President of the International Lithosphere Program

10:10- 12:10 Session 1: Lithosphere structure and evolution from upper crust to asthenosphere

Chair: I. Kukkonen

10:10 - 10:30 **E. Chopin, A. Korja, K. Nikkilä, P. Hölttä, T. Korja, M.A. Zaher, M. Kurhila, O. Eklund, O.T. Rämö, Y. Lalaye, H. O'Brien and M. Sayab:** The Vaasa migmatitic complex: new results and perspectives for the tectonic evolution of the Svecofennian orogeny

10:30 – 10:50 **K. Nikkilä, P. Skyttä, A. Saukko and O. Eklund:** Structural evolution and melt formation within the southernmost Finland migmatitic belt

10:50 – 11:10 **A. Saukko, K. Nikkilä O. Eklund and M. Väisänen:** Granites of southernmost Finland

11:10 – 11:30 **M. Nilov, L. Bakunovich, N. Sharov and B. Belashev:** Magnetic inhomogeneities of the White Sea region crust

11:30 – 11:50 **T. Veikkolainen, T. Luhta and I.T. Kukkonen:** Modelling geotherms of the Wiborg rapakivi batholith in southeastern Finland in light of seismic data

11:50 – 12:10 **A.A. Lebedev, and N.V. Sharov:** Natural seismicity in Russian Karelia

12:10 - 13:00 Lunch break

13:00-14:20 Session 2: Lithosphere structure and evolution from upper crust to asthenosphere (cont.)

Chair: E. Kozlovskaya

13:00 – 13:20 **T. Karinen, S. Heinonen, J. Konnunaho, H. Salmirinne, I. Lahti and A. Salo:** Koillismaa Deep Hole – solving the mystery of a geophysical anomaly

13:20 – 13:40 **O. Kaisko and M. Malm:** Micro earthquakes at the Olkiluoto nuclear fuel final disposal facility construction site in 2002-2018

13:40 – 14:00 **Y. Wang and D. Whipp**: Numerical modelling of oblique subduction in the Southern Andes region

14:00 – 14:20 **I.A. Yacouba and V.N. Glaznev**: The thickness of the Earth's crust in the territory of Republic of the Niger according to the stochastic interpretation of the gravity field

14:20 - 14:40 Coffee/Tea break

14:40 – 15:20 **Poster session 1** (Posters 1-6)
Chair: F. Karell

P01. L. Ylä-Mella, I. Kukkonen and D. Whipp: Forward and inverse modelling of terrestrial cosmogenic nuclides to detect past glaciations

P02. I.A. Ponomarenko and O.M. Muravina: Application of the Group Method of Data Handling for the analysis of petrophysical and geophysical data

P03. J. Nevalainen, J-P. Ranta, E. Kozlovskaya, M. Kirsch, L. Ajjabou and R. Gloaguen: Non-invasive Exploration technologies in the INFAC project: Examples from the reference sites

P04. T.-C. Lin, G. Hillers, S.-J. Lee and S.-H. Hung: Imaging the Internal Structure along the Longitudinal Valley Fault System, Taiwan, Using Fault Zone Head Waves

P05. M. Holma, P. Kuusiniemi and K. Loo: An introduction to principles of muography in continental scientific boreholes

P06. E. Lehtonen: Geology field in The Helsinki Term Bank for The Arts and Sciences (Tieteen termipankki)

P07. V. Järvinen, T. Halkoaho, J. Konnunaho, J.S. Heinonen and O.T. Rämö: Sm-Nd isotope systematics of the Precambrian mafic-ultramafic Näränkävää intrusion.

15:20 – 16:20 Session 3: Lithosphere evolution, structures and mineral resources
Chair: E. Tanskanen

15:20 – 15:40 **V. J. Virtanen, J. S. Heinonen, N. Barber and F. Molnár**: The effects of assimilation on sulfide saturation and the formation of norite-hosted Cu-Ni deposits in the Duluth Complex, Minnesota

15:40 – 16:00 **M. Vasilopoulos, F. Molnár, H. O'Brien and Y. Lahaye**: Comparing geochemical characteristics of a gold-only and a base metal-rich orogenic mineralization from the Central Lapland Greenstone Belt, northern Finland

- 16:00 – 16:20 **L. Paolillo and C. Giapis:** A preliminary assessment of hydrothermal alterations in the giant Kiruna IOA deposit, Kiruna, Sweden
- 16:20 – 16:40 **R. Latypov, J. S. Heinonen and S. Chistyakova:** Thermodynamic constraints on assimilation of floor cumulates by superheated basaltic-andesitic melts in the Bushveld Complex, South Africa
- 16:40 – 17:20 **KEYNOTE TALK: P.M. Malin:** The Geocritical-Rock Physics and Fracture-Seismic Mapping of Permeability in the Brittle Lithosphere

Wednesday, Jan 20

09:00-10:20 Session 4: Archaean and Proterozoic lithosphere structure and evolution Chair: S. Heinonen

- 9:00 – 9:20 **K. Kärenlampi, A. Kontinen, V. Kylli and Y. Lahaye:** Conglomeratic rocks fringing the Archean Iisalmi block in central Finland: Evidence for the timing and nature of the break-up of the Karelia craton
- 9:20 – 9:40 **S. Hietala, A. M. Hall, N. Putkinen, E. Lindsberg and M. Holma:** Impact structures as indicators of cratonic denudation
- 9:40 – 10:00 **S.I. Berezneva, O. M. Muravina, and T.A. Voronova:** Technology for studying the structure of the upper crust of the Voronezh Crystalline Massif by detailed density modeling data
- 10:00 – 10:20 **L. Bakunovich, B. Belashev, N. Sharov and M. Nilov:** Modeling the structure of the Earth's crust of the White Sea region

10:20 – 10:40 Coffee/tea break

10:40 – 12:00 Session 6: Induced seismicity, geothermal energy Chair: M. Poutanen

- 10:40 – 11:00 **M. Holma and P. Kuusiniemi:** Cosmic-ray based geothermal exploration – A short introduction to muography
- 11:00 – 11:20 **G. Taylor, G. Hillers and T. A.T. Vuorinen:** Array-derived rotational motion of induced earthquakes
- 11:20 – 11:40 **I.T. Kukkonen, M. Pentti and P.J. Heikkinen:** St1 Deep Heat Project: Hydraulic stimulation at 5 – 6 km depth in crystalline rock

11:40 – 12:00 **A.E. Rintamäki, G. Hillers, T.A.T. Vuorinen, K. Galvin, J. Keskinen, T.-C. Lin, T. Luhta, T. Oksanen, J. Pownall, P. Seipäjäarvi, G. Taylor, C. Tsarsitalidou, A. Voutilainen and D. Whipp:** A network to study the induced seismicity related to the Otaniemi deep geothermal power plant

12:00 – 12:40 Lunch break

12:40 – 13:20 **Poster session 2** (Posters 7-13)

Chair: K. Nikkilä

P08. A.A. Lebedev and I.A. Zueva, Features of explosive seismicity in the Kostomuksha ore region

P09. N. Afonin, E. Kozlovskaya and J. Okkonen: Frost quakes in northern Finland: possible source mechanisms and formation process

P10. C. Tsarsitalidou, B. Giammarinaro, G. Hillers, P. Boué and L. Stehly: Seismic surface wave focal spot imaging

P11. A.M. Rantanen, D.M. Whipp, J.S. Heinonen, L. Kaislaniemi and M. Putz: Influence of Pulsed Magmatic Activity, Latent Heat, and Partial Melting on the Strength of the Continental Crust

P12. A. Korja, N. Junno and SEISMIC RISK Working Group: SEISMIC RISK – Mitigation of induced seismic risk in urban environments

P13. M. Holma, T. Arola and P. Kuusiniemi: Finnish crustal-scale faults as a possible source of deep low-enthalpy geothermal resources

P14. T. Vehkamäki, M. Väisänen, M. Kurhila, H. O'Brien, P. Hölttä and J.-K. Syrjänen: Metamorphic zones in SW Finland: monazite and zircon U-Pb dating of leucosomes in paragneisses

13:20 – 13:30 Coffee/Tea break

13:30 – 15:20 **Session 7: Crustal structures and mineral resources**

Chair: P. Skyttä

13:30 – 13:50 **M. Etienne, I. Bacquet, D. Monteith and L.S. Lauri:** The iron oxide mineralised Matojärvi formation, Kiruna, Sweden

13:50 – 14:10 **M. Väisänen, J. Kara, H. Penttinen, Y. Lahaye, H. O'Brien and P. Skyttä:** U-Pb zircon dating of igneous rocks in the Salo area, SW Finland

14:10 – 14:30 **O. Eklund and K. Nikkilä**: Biotite as a petrogenetic tool in granite-migmatite areas

14:30 – 14:50 **S. Karvinen, A. Heinonen and C. Beier**: The trace element composition of magmatic apatite: Mineralogical and geological controls on apatite trace element chemistry in magmatic systems

14:50 – 15:10 **R. Fred, A. Heinonen and J.S. Heinonen**: Fractional crystallization of massif-type anorthosite parental magmas and equilibrium crystallization of monzodioritic residual magmas

15:10 – 15:30 **M.A. Aaltonen, C. Beier, A. Abersteiner, and A.P. Heinonen**: Trace element and platinum group element distribution in chromites: constraints on mineral chemical tracers in mafic-ultramafic host lithologies

15:30 – 15:50 Coffee/Tea break

15:50 – 16:30 Session 9: Short communications

Chair: I. Kukkonen

15:50-16:00 **A. Korja, K. Atakan, P.H. Voss, M. Roth, K. Vogfjord, E. Kozlovskaya, E.I. Tanskanen, N. Junno and Nordic EPOS Working Group**: Nordic EPOS - A FAIR Nordic EPOS Data Hub

16:00-16:10 **A. Korja, M. Poutanen, S. Mertanen, E. Kozlovskaya, T. Fordell, J. Leveinen, A. Viljanen, A. Pursula, N. Junno and FIN-EPOS Working Group**: FIN-EPOS – Finnish national node of the European Plate Observing System

16:10 – 16:20 **M. Poutanen**: United Nations and Subcommittee on Geodesy

16:20 – 16:30 **E.I. Tanskanen, J. Tammi, J. Pulliainen, H. Koivula and E2S team**: Earth-Space Research Ecosystem: scientific and industry collaboration platform

16:30 – 16:45 Concluding remarks and poster award

16:45 Closing of the Symposium