



## Online short course on “Fingerprinting techniques in mineral exploration”

Organizers: UiT, GTK, GEUS, OMS

June 14-18, 2021 (Time is given as CEST)

MinExTarget, UiT The Arctic University of Norway, in collaboration with AGH University of Science and Technology, Geological Survey of Denmark and Greenland (GEUS), Geological Survey of Finland (GTK), University of Oulu (OU), and EIT RM Academy, is inviting Master and PhD students to participate in the short course on “Fingerprinting techniques in mineral exploration”. The students will gain general knowledge about geology and mineral potential of Fennoscandia and Northern Europe and learn about traditional and modern mineral exploration techniques. A particular focus will be given to sampling, sample preparation, analytical techniques and data processing. The course consists of lectures, practical work and discussions.

### Program:

#### Day 1.

<i>Time</i>	<i>Speaker and Title</i>
10:30	<b>Sabina Strmic Palinkas, Yulia Mun (UiT):</b> Welcome word to participants and speakers
10:40	<b>EIT RM Academy:</b> Introduction to EIT RM Academy
10:50	<b>Ferenc Molnar (GTK):</b> MinExTarget – innovation project in mineral exploration
11:30	<b>Pasi Eilu (GTK):</b> Geology and ore potential of the Fennoscandian Shield
12:15	Lunch
13:00	<b>Sabina Strmic Palinkas (UiT):</b> Mineral exploration in Norway
13:30	<b>Stefan Bernstein (GEUS):</b> Mineral systems in Greenland – two examples from globally important deposit types
14:00	<b>Adam Piestrzyński, Wladyslaw Zygo (AGH):</b> Geology and mineral deposit perspectives in Poland
14:30	Break
14:45	Introduction to the Student practices in the course
15:00	Discussion
15:15	<b>End of the Day</b>

#### Day 2.

<i>Time</i>	<i>Speaker and Title</i>
10:00	<b>Hannu Ahola (Palsatech):</b> Exploration methods, part 1: Sampling and sample preparation: Heavy mineral sampling, concentration and research in glaciated terrains
10:45	<b>Yulia Mun (UiT):</b> Exploration methods, part 2: Stream sediments and marine sediments in mineral exploration
11:30	<b>Pertti Sarala (GTK):</b> Mineral exploration in glaciated terrain: Case studies from Finland
12:15	Lunch

13:00	Practical work in small groups
14:45	Break
15:00	<b>Beth McClenaghan (GSC):</b> Application of indicator minerals in mineral exploration in Canada
15:45	Discussion
16:00	<b>End of the working Day</b>
18:00	<b>Online social gathering</b>

### Day 3

<i>Time</i>	<i>Speaker and Title</i>
10:00	<b>Sabina Strmic Palinkas (UiT):</b> Fluid, melt and solid inclusions in mineral exploration
11:00	<b>Lahaye Yann (GTK):</b> Non- traditional stable isotope and radiogenic isotopes in exploration
12:00	Lunch
13:00	<b>Alan Butcher (GTK):</b> Geoanalytical techniques: combining optical microscopy, e-beam, X-ray beam & laser beam-based technologies for a multi-modal, multi-dimensional approach
14:00	Break
14:15	Video tour to the MinExTarget consortium laboratory facilities
14:45	Practical work in small groups
16:15	<b>End of the Day</b>

### Day 4

<i>Time</i>	<i>Speaker and Title</i>
09:30	<b>Paavo Nikkola (GTK):</b> Trace element content of pyrite: a proxy for ore-forming conditions and a potential tool for mineral exploration targeting
10:15	<b>Sara Raic (GTK):</b> Processing and fingerprinting of mineral trace element data by unsupervised machine learning
11:00	Break
11:15	<b>Ferenc Molnar (GTK):</b> Mineral trace element and isotopic footprints of orogenic gold deposits in Finland
12:15	Lunch
13:00	<b>Peter Filzmoser (Vienna University of Technology):</b> Introduction to data analysis techniques and the CODA approach
13:50	<b>Maarit Middleton (GTK):</b> Quality assurance and quality control of surface geochemical data
14:30	Break
14:40	Practical work in small groups
16:15	<b>End of the Day</b>



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## Day 5

<i>Time</i>	<i>Speaker and Title</i>
09:15	<b>David Cohen (UNSW Sydney):</b> Integration of geochemical databases into the decision-making procedure of mineral exploration targeting
10:15	<b>David Whitehead (GEUS):</b> Storing geochemical data in databases
11:00	<i>Break</i>
11:15	Practical work in small groups
12:30	<i>Lunch</i>
13:30	Short presentations of students group works
14:50	Concluding word from organizers
15:00	<b>End of the Short course</b>

**Within two weeks after the course:** Sending of participation certificates

### Requirements for the course:

**Education:** Bachelor degree and higher in field of geology, geosciences, and/or mineral exploration, **PhD students are prioritized**, professionals

**Short motivation letter** (max. 1 page) should be sent to: Yulia Mun [Yulia.mun@uit.no](mailto:Yulia.mun@uit.no), cc: Sabina Strmic Palinkas [sabina.s.palinkas@uit.no](mailto:sabina.s.palinkas@uit.no), Sarala Pertti [pertti.sarala@gtk.fi](mailto:pertti.sarala@gtk.fi), Ferenc Molnàr [ferenc.molnar@gtk.fi](mailto:ferenc.molnar@gtk.fi), within **May 20 2021**. The letter should include correct name and contact details that will be later used for certificate.

**Max. number of students participating in group work:** 25

**Participants for lectures:** 50

**Price:** free