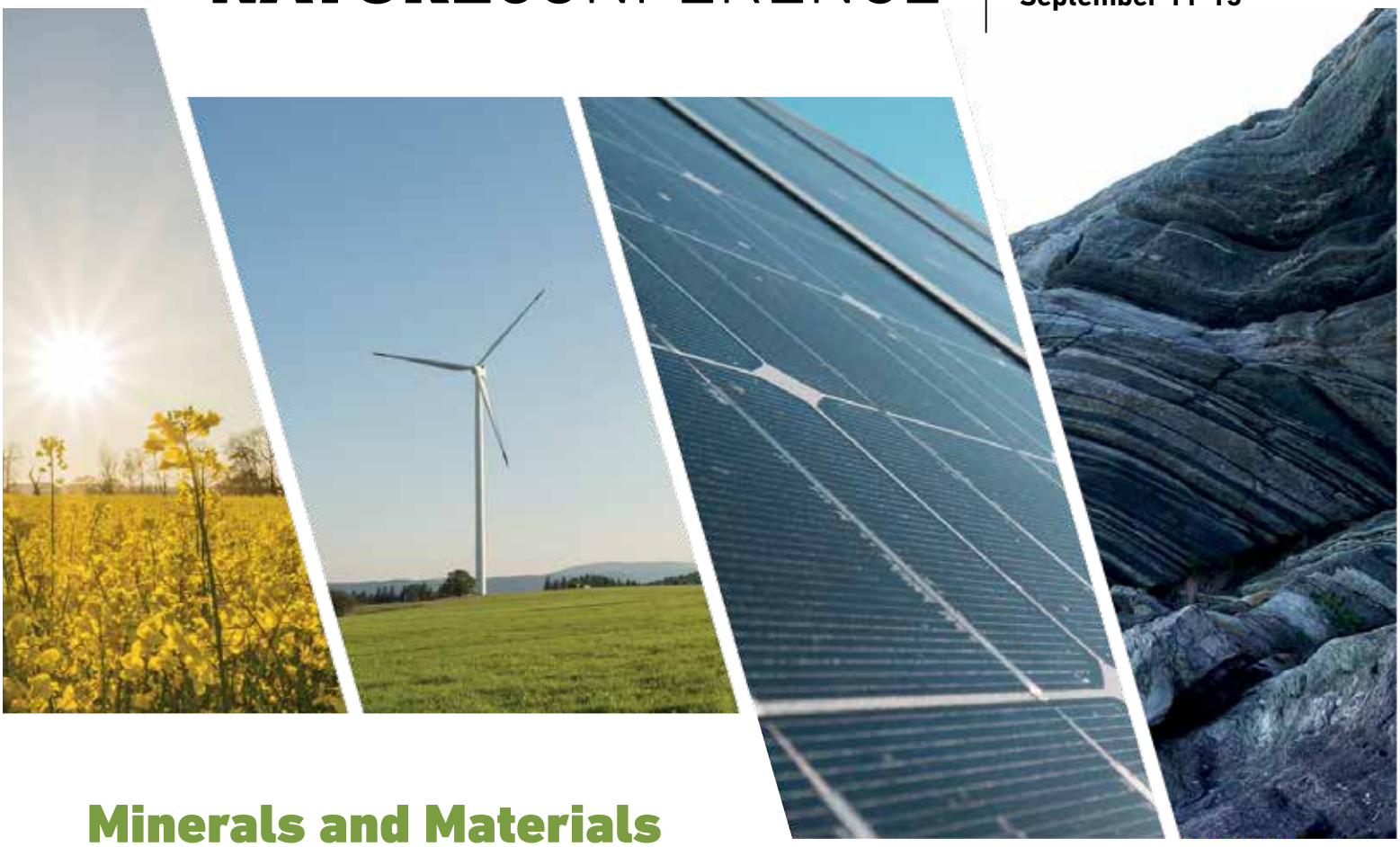
PROGRAM
NATURECONFERENCE

Trondheim
September 11-13



Minerals and Materials for a Sustainable Future

TUESDAY, SEPTEMBER 11

11:00 – 12:45 **Registration** starts

11:30 – 12:45 Lunch

12:45 – 13:00 **Welcome and opening** (State Secretary Daniel Bjarmann-Simonsen, Ministry of Trade, Industry and Fisheries, Norway)

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TUESDAY, SEPTEMBER 11

Session 1:
Global Challenges

To meet the Paris climate agreement, the United Nations sustainable development goals, and to continue to improve standards of living across the globe, requires new technologies, materials and infrastructure. Reducing carbon emissions and our reliance on fossil fuels requires, at least: a transition to renewable energy sources, improved energy storage and batteries, and innovative building materials. In this session invited speakers will outline some of the major challenges and opportunities associated with this transition, generated by the global demand: What mineral resources are required to meet the demands of an expanding global population and the transformation to a green economy? How will technological development impact these needs? How can we achieve a circular economy?

13:00 – 13:30 **Welcome to Trondheim and Trøndelag** (Tore O. Sandvik, County Mayor of Trøndelag)

13:10 – 13:30 **Technologies change the world. Minerals and materials are needed** (Alexandra Bech Gjørv, CEO SINTEF)

13:30 – 14:00 **A research agenda for supporting meaningful progress on Resource Efficiency** (Julian Allwood, Professor, University of Cambridge)

14:00 – 14:30 **Raw Materials for sustainable development: Opportunities and challenges** (Karen Hanghøj, CEO, European Institute of Innovation & Technology (EIT) Raw Materials)

14:30 – 15:00 Coffee break

15:00 – 15:30 **Critical Minerals: Meeting the Challenges of the Transition to a Renewable Energy Future** (Steven Fortier, Director, National Minerals Information Center, U.S. Geological Survey)

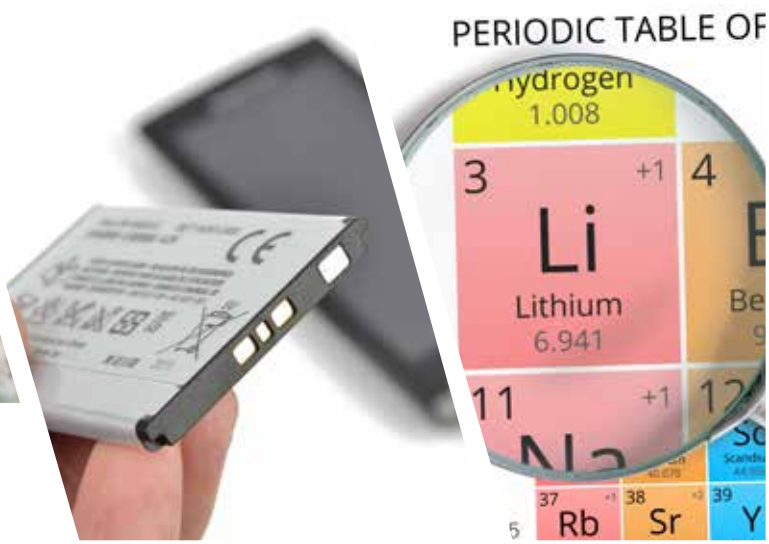
15:30 – 16:00 **Resource Governance: Pathways from Environmental Conflicts to Cooperation** (Saleem Ali, Professor, University of Delaware)

16:00 – 16:30 **What We Will Need and How We Can Get It** (Alexander King, Professor, Iowa State University)

16:30 – 17:30 **Panel discussion, the challenges**: The demand for mineral resources and materials: can the global community cope with it? Do we face depletion of mineral resources? Can material science compensate for lack of resources? Is the circular economy realistic?

19:00 **Concert in Nidaros Cathedral, a gift from Trondheim Municipality** (doors open 18.45 pm)

19:30 **Reception Café To Tårn/Café Two Towers** (next to the Cathedral by the West Front)



WEDNESDAY, SEPTEMBER 12

Session 2:
Minerals for the future

Recycling and new technologies alone cannot meet the raw material demands of a sustainable future and an expanding population. We need to identify and exploit new mineral resources, as well as maximising the potential of existing deposits. We welcome contributions addressing all aspects of mineral resources, including (but not limited to): The future supply of existing and emerging mineral resources; geological depletion and critical minerals; challenges related to the beneficiation and processing of minerals; and new frontiers of exploration – from the seafloor to mining the anthroposphere.

9:00 – 9:30 **Outer limits: Past, present and future frontiers for mineral and metal resources**
(Andrew Bloodworth, Director, British Geological Survey)

9:30 – 10:00 **Magmatic Ni-Cu-PGE deposits: global endowment and exploration outlook**
(Stephen John Barnes, CSIRO Mineral Resources, Australia)

10:00 – 10:30 **Frontiers in Ocean Exploration – the Mineral Resources Perspective**
(Mark Hannington, Professor, GEOMAR | Helmholtz Centre for Ocean Research, Kiel)

10:30 – 11:00 Coffee break

11:00 – 11:20 **Microthermometry of fluid inclusions entrapped in hydrothermal vents along the Arctic Mid-Ocean Ridge: an insight into geochemistry of modern analogues of ore-forming fluids associated with volcanogenic massive sulfide deposits**
(Sabina Strmic Palinkas (University of Tromsø), Rolf B. Pedersen and Ingunn H. Thorseth (University of Bergen))

11:20 – 11:40 **The Fen Carbonatite Complex, Norway: A potential European World Class REE Mineral Deposit** (Sven Dahlgren, Geological Advisor, Buskerud Telemark Vestfold County Councils)

11:40 – 12:00 **Nature's Template: Giant Exchange Bias Systems in Mineral Intergrowths**
(Suzanne McEnroe, Professor, NTNU)

12:00 – 12:20 **Bolivian-Type Deposits: a Sustainable Source for Indium**
(Joan Carles Melgarejo (Universitat de Barcelona), Lisard Torró, Diva Mollinedo, David Artiaga, Belén Torres, Alvaro Martínez, Malena Cazorla, Laura Gemmrich, Joaquin Proenza, Marc Campeny, Cristina Villanova-De-Benavent, Montgarri Castillo-Oliver, Núria Pujol, Júlia Farré-De-Pablo, Esperança Tauler)

WEDNESDAY, SEPTEMBER 12

Session 3:
Materials for the future

Advanced material technology will be key to meet future challenges, requiring novel research in a rapidly changing world. We welcome contributions that address significant developments in material science, including (but not limited to): materials for green technologies; links between material science and minerals; novel processes and designs that enable more efficient production, reuse and recycling; material science for digitalization; and the future of advanced material technology.

12:20 – 13:00 **The Future of Engineering Stardust**
(Ragnhild Elizabeth Aune, Gabriella Tranell, Merete Tangstad, professors, NTNU)

13:00 – 14:00 Lunch

14:00 – 14:20 **Impurity Measurements in Si And SiO_2 for Multicrystalline Solar Cell Production**
(Jochen Busam (NTNU), Gaute Stokkan (SINTEF), Astrid Marie F. Muggerud (The Quartz Corp), Marisa Di Sabatino (NTNU))

14:20 – 14:40 **Novel Synthesis of High Temperature Resist Smart Zeotype Material for Sustainable Solar Cell**
(Jha Rupali, Modhera Bharat, Maulana Azad National Institute of Technology, Bhopal)

14:40 – 15:00 **Complex Oxide Functional Materials for Clean Energy Applications**
(Anuradha M Ashok, PSG Institute of Advanced Studies, Peelamedu Coimbatore)

15:00 – 15:20 **Next generation of Thermoelectric Generators based on Silicon**
(Joachim Seland Graff, SINTEF)

15:20 – 15:40 **Amorphous Silicon Nitride - an Anode Material for the Next Generation Li-Ion Batteries**
(Hanne Flåten Andersen, Head of Department, Institute for Energy Technology)

15:40 – 16:00 Coffee break

WEDNESDAY, SEPTEMBER 12

Session 4:
Minerals and materials in a circular economy

Recycling and the circular economy play essential roles in building a sustainable future, but waste at every stage makes recycling an inefficient process. It is imperative to identify where and why there are leaks in the system and how to limit material and energy losses. We welcome contributions that address the technological and socio-economic aspects of material recycling, including (but not limited to): lifecycle assessment and life cycle management; systemic approaches to material streams; and the possibilities and limitations for recycling

16:00 – 16:30 **Title to be announced**
(Barbara Reck, Professor, Yale School of Forestry & Environmental Studies)

16:30 – 17:00 **A systems approach for the monitoring the physical economy**
(Daniel Beat Müller, professor, NTNU)

17:00 – 17:20 **Characterisation of Incinerator Slags – A Tool for Identification of Leakages in the Circular Economy**
(Rune J. Clausen (GEUS), Per Kalvig (GEUS) and Jonas Nedenskov (Amager Resource Center)

17:20 – 17:40 **Recovery of Rare Earths from Secondary Resources** (Ana Maria Martinez (SINTEF Industry))

17:40 – 18:30 **Poster session**

20:00 **Conference dinner** at the Scandic Nidelven hotel

THURSDAY, SEPTEMBER 13

Session 5:
Sustainable and responsible resourcing of minerals and materials

Here we address topics with a diverse and global outlook that address: our ability to sustainably deliver economic development and improved standards of living globally; the ethics and responsibility of resource supply (including environmental and social impacts); approaching sustainability in the context of minerals and materials; and communication between scientists, industry, and policy makers, alongside social engagement.

9:00 – 9:30	**Responsible sourcing of minerals** (Frances Wall, Professor, Camborne School of Mines, University of Exeter)
9:30 – 10:00	**Minerals, Materials and Sustainability Goals** (speaker TBA)
10:00 – 10:30	**Crushed Fine Aggregates for Concrete Production: Should new Type of Environmental Parameters be Introduced Parallel to the Technical Requirements?** (Børge Johannes Wigum (NTNU and Heidelberg Cement) and Rolands Cepuritis (NTNU and NORCEM))
10:30 – 11:00	Coffee break
11:00 – 11:20	**Resource Availability Issues – Mineral Reserves and Material Flow Analysis** (Mark Uwe Simoni (NTNU/NGU), Tom Arne Heldal (NGU) and Daniel Beat Müller (NTNU))
11:20 – 11:40	**Apatite in fertiliser production as a source for rare earth elements** (Arne Petter Ratvik, SINTEF Industry)
12:00 – 13:00	**Panel discussion, facing the challenges:** How do the science community respond to the challenges? How do we prepare for a circular economy? What kind of scientific collaboration is needed?
13:00	**Closure of conference**/lunch