



# GOLDSCHMIDT®

## BARCELONA 2019

18–23 AUGUST



# PROGRAM



# Goldschmidt2019 Welcome

Dear Colleagues,

It is my pleasure to welcome you to the 29th Goldschmidt Conference hosted in the beautiful city of Barcelona, the city of Gaudí, Picasso, Dalí, Miró and Barça.

The Goldschmidt Conference is the premier conference for geochemistry and this year's Barcelona Goldschmidt is the second largest ever. The scope is impressive: the origin of the Earth and planets, the chemical processes that have shaped Earth's evolution over time, the interconnections between life and the physical world, the search for new resources, and the environmental challenges facing today's world.

The Scientific Committee, led by Helen Williams and Derek Vance, has put together a very exciting program spanning the wide range of topics featured at the conference. The week is packed with opportunities to hear cutting-edge talks, discuss hot-off-the-press science on posters, visit innovative exhibitors, watch captivating flash talks in the exhibition area, and, for early career scientists, to pair up with a mentor, meet the plenary speakers, or take part in workshops aimed at professional development. There are also fantastic opportunities for delegates to interact socially at the Icebreaker, the Goldschmidt Club Night, the Conference Banquet in the Drassanes Maritime Museum, or at one of the other receptions that will expand your scientific network.

Here at Goldschmidt, we want everyone to feel comfortable when presenting work, interacting, and having fun. Towards this goal, we have adopted a code of conduct for the meeting (see page iii), which all of you have agreed to as part of your registration.

I very much look forward to seeing you in Barcelona and hope that you will enjoy your Goldschmidt.

**Sigurður (Siggi) Gíslason**

President, European Association of Geochemistry (EAG)



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# Conference Committees

## Organising Committee

**Helen Williams**

University of Cambridge - Co-chair

**Derek Vance**

ETH Zürich - Co-chair

**Joan Martí Molist**

CSIC - LOC chair

**Sigurdur Gislason**

University of Iceland -

EAG President

**Bernard Marty**

CRPG Université de Lorraine -

EAG Past President

**Rizlan Bernier-Latmani**

EPFL - Grant Program

**Sami Mikhail**

University of St. Andrews - Early Career Program

**Arola Moreras Martí**

University of St Andrews - Early Career Program

**Estelle Rose-Koga**

Université Clermont Auvergne -

EAG Treasurer

**Marie-Aude Hulshoff**

EAG Université Clermont Auvergne

## Science Committee

**Helen Williams**

The University of Cambridge - Co-chair

**Derek Vance**

ETH Zürich - Co-chair

**Thomas Bianchi**

University of Florida, Gainesville

**John Brodholt**

University College London

**Katy Evans**

Curtin University (AU)

**Frederic Moynier**

Institut de Physique du Globe de Paris

**Britta Planer-Friedrich**

University Bayreuth

**Silke Severmann**

Rutgers University

**Joshua West**

University of Southern California

## Local Organising Committee

**Joan Martí Molist** CSIC - Chair

**Jordi Bruno** Amphos 21

**Javier Escartin** IPGP

**Fidel Grandia** Amphos21





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- 535 Seasonal Development of Zn, Pb, As and Cd Contents in the Biomass of Selected Grass Species Growing on Contaminated Soils: Implications for Phytostabilization  
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- 536 Biogeochemical Mapping of Mine Contamination with Portable XRF  
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- 538 Geochemical and Mineralogical Heterogeneity in a Full-Scale Waste-Rock Pile  
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- 540 Diversity of Microbial Arsenic and Antimony Transformation Pathways Associated with Antimony Mine Tailing  
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- 541 Study and Simulation of Pesticide Transport in Agricultural Soil of the Gharb Region (Morocco): The Case of Methomyl and Carbofuran  
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# **A case study of realgar and stibnite weathering in an iron-deficient environment: the abandoned Lojane flotation tailings dump, North Macedonia**

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Realgar and stibnite are the primary sources of As and Sb contamination of the waters and soils at the Lojane mining site, where an Sb-As-Cr deposit was mined until 1979. The waste material comprises waste dumps, flotation tailings dump, and arsenic smelter. We have studied the association of As and Sb in realgar and stibnite oxidation products from material sampled at the (sub)surface of the fine-grained (20 to 100  $\mu\text{m}$ ), porous flotation tailings. XRD and Raman spectroscopy, combined with SEM-EDX, TEM-SAED, TEM-EDX, and TEM-EELS, have been used to determine chemistry, mineralogy and element distribution in the weathering products.

The weathering of the Fe-poor and realgar-rich tailings (~60 wt% realgar), containing significant amounts of stibnite (up to 13.5 wt%), produces a mixture of  $\text{Fe}^{3+}$ -rich nanocrystalline roméite-group minerals (RMG) and X-ray amorphous As-dominant RGM-like phases, in which both Sb and As, and partly also Ni, are hosted. Weakly Sb-bearing scorodite is another important product of realgar and stibnite oxidation. As further secondary phases we observed are As-bearing sulfur, arsenolite, limonite, pickeringite (Ni- and Fe-bearing), alunogen, and annabergite.

The variable or unknown (RGM phases) solubilities of the identified secondary phases is expected to influence mobility of As and Sb in the near-surface environment.

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