



LabEx RESSOURCES21

## International workshop - Nancy, France ***Rare earth elements supply: challenges and perspectives***



Tuesday, October 8<sup>th</sup>

*Welcome coffee 9:30 – 10:00\*\**

### ***Session 1: REEs: scientific and societal challenges***

10:00-10:30 **keynote Michel Cathelineau** “Rare element supply and mining: economic aspects and scientific challenges for Labex Ressources21”

### ***Session 2: Natural concentrations and geochemical cycle: Carbonatites***

10:30-11:00 **keynote Lydéric France** “Key igneous parameters at the single active carbonatite volcano: Tracking and quantifying the REE concentration processes”

11:00-11:20 **Céline Baudoin** et al. “New constraints on trace element partitioning between minerals and alkaline melts”

11:20-11:40 **Joan Carles Melgarejo** et al. “REE and Sc minerals in alkaline rocks and carbonatites from Western Sahara”

11:40-12:00 **Joan Carles Melgarejo** et al. “REE enrichments in carbonatites formed at different emplacement levels: the Angola case”

*Lunch offered by LabEx R21*

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### ***Session 2: Natural concentrations and geochemical cycle: monazites and felsic magmas***

14:00-14:20 **François Turlin** et al. “Peraluminous pegmatoids with several thousand of ppm of LREE in the Central Grenville Province”

14:20-14:40 **Maria Kohk** et al. “An experimental study of the REEs solubilities in sodium-rich carbonate-bearing aqueous solutions under hydrothermal conditions”

14:40-15h00 **Lev Filippov** et al. “Recovery of rare earths and rare metals minerals from the mineral processing waste streams”

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\*\*Venue: Faculty of Science FST “Campus des Aiguillettes” Vandoeuvre-lès-Nancy, Auditorium 8

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### ***Session 3: Environment and secondary resources: mines and sediments***

15:00-15:30 **keynote Benoît Plante** “Assessment of drainage quality from REE-bearing mine wastes”

15:30-15:50 **Anne Sylvie André-Mayer & Laure Giamberini** et al. “Biogeochemical cycle of Lanthanides in a light Rare Earth element-enriched geological area (Quebec, Canada)”

15:50-16:10 **Rafael Leon** et al. “Mine waters as a secondary source of critical raw materials worldwide: the case of the Iberian Pyrite Belt”

16:10-16:30 **Christophe Hissler** and Emmanuelle Montargès-Pelletier “REE fractionation and potential mobility in riverbed sediments impacted by steel-making activity”

*Coffee break 16:30-16:45*

### ***Session 4: Secondary resources***

16:45-17:05 **Ricardo Millan-Becerro** et al. “Alkaline treatment of highly acid leachates from the fertilizer industry”

17:05-17:25 **Virginie Nachbaur** et al. “Recovery of REE by a Sustainable Recycling Process applied to Nd-Fe-B Permanent”

17:25-18:30 **Posters&Beers**

Wednesday, October 9<sup>th</sup>

*Welcome coffee 9:00-9:30*

### ***Session 5: REE transfers from soils to biota***

9:30-9:50 **Axel Denys** et al. “Distribution of Rare Earth Elements in a weathering profile: insights and pitfalls from sequential extractions experiments”

9:50-10:10 **Ruoyu Hu** et al. “Transfer mechanism of rare earth elements (REEs) from soil to plants by arbuscular mycorrhizal (AM) fungi”

10:10-10:30 **Marie Le Jean** et al. “Identification of new hardy ferns that preferentially accumulate light rare earth elements: a conserved trait within fern species”

### ***Session 6: Speciation and bioavailability***

10:30-11:00 **Keynote Rémi Marsac** et al. “Modeling REE speciation in organic-rich waters”

11:00-11:20 **Charlotte Berthelot & Patrick Billard** “Whole-cell bioreporters for the detection of bioavailable rare earth elements”

### **Session 7: Ecotoxicological effects**

11:20 – 11:50 **keynote Susanne Heise** & Heinz Stichnoth “Environmental Impact of REE-Mining -from local to global”

*Lunch offered by LabEx R21*

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13:30- 13:50 **Nicolas Lachaux** et al. “Ecotoxicological assessment of Rare Earth Elements for aquatic ecosystems by normalized assays”

13:50-14:10 **Kahina Mehennaoui** et al. “Chronic effects of REE-enriched sediments on the reproductive cycle of *Gammarus fossarum* (Crustacea Amphipoda)”

14:10 – 14:30 **Emmanuel Fleurbaix** et al. “*In vitro* cytotoxicity of rare earth elements alone and in mixtures to fish cell lines (*Danio rerio*)”

14:30 – 15:00 **keynote Jovette Godbout** “Towards a sustainable mining industry?”

*Coffee break 15:00-15:15*

15:15 – 16:45 **Roundtable: review and perspectives**

Thursday, October 10<sup>th</sup>

*Welcome coffee 8:30-9:00*

### **Session 8: Restoration of ionic REE mine tailing in Southern China**

9:00-9:30 **keynote Hermine Huot** and Yetao Tang et al. “Phytoremediation of rare earth mining sites in south China”

#### **8.1 From soil to plant speciation**

9:30 – 9:50 **Noémie Janot** et al. “Speciation of REEs in ionic REE mine tailings under reclamation: Experimental and modelling study”

9:50-10:10 **Wen-Shen Liu** et al. “Rare earth elements, aluminium and silicon distribution in the fern *Dicranopteris linearis* revealed Maia  $\mu$ PIXE »

10:10-10:30 **Marie-Odile Simonnot** “Key parameters of a novel process for the recovery of the REEs from the hyperaccumulator fern *Dicranopteris linearis*”

*Coffee break 10:30-10:50*

## **8.2 Risks and restauration**

10:50-11:10 **Hermine Huot** et al. “Phytostabilization and natural revegetation of ionic rare earth element mine tailings in South China”

11:10-11:30 **Nicolas Brosse** et al. “Industrial Ramie growing on Rare Earth Elements contaminated soil in Southern China: Defibration and fibers quality”

11:30-11:50 **Thierry Begueristain & Carole Cossu-Leguille** et al. “Ecological tests on ionic REE mine tailings”

11:50-12:20 **keynote Alain Rollat** “Rare Earths: market, sourcing and processing”

12:20-13:00 **Conclusion** by Michel Cathelineau & Laure Giamberini & Jean Louis Morel

*Lunch offered by LabEx R21*

**14:30 End of the REE workshop**

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## **Posters**

1. Guo Mei-Na, Huot Hermine, Liu Chang, Liu Wen-Shen, Séré Geoffroy, Watteau Françoise, Morel Jean Louis, Tang Ye-Tao, Qiu Rong-Liang “Structure formation and evolution of soils developing on ion-adsorption Rare Earth Element mine tailings”
2. P. Louis, A. Messaoudene, H. Jrd, B.A-H. Ahmed, M.N. Pons, D.A.L. Vignati “REE patterns along the Moselle River: effect of geology and land use”
3. A. OTERO-FARIÑA, N. JANOT AND J. E. GROENENBERG “Rare earth elements binding to organic matter: an experimental and modelling study”
4. Noémie Janot, Jan E. Groenenberg, Alba Otero-Fariña, José Paulo Pinheiro “Free  $\text{Eu}^{3+}$  determination in natural waters”
5. Lambert Fanny et al.
6. Anne-Sophie Coquerel “Legal Services to the Mining Industry”
7. Nicolas Grosjean, Marie Le Jean, Jean Armengaud, Michel Chalot, Elisabeth Maria Gross, Damien Blaudez “Omics studies to investigate the response of an eukaryotic model organism to Rare Earth Elements”
8. Justine Pigot, Hermine Huot, Li Ya-Ying, Guo Mei-Na, Ye Pengxian, Tang Ye-Tao, Chao Yuan-Qing, Apolline Auclerc “Study of the soil biodiversity along a chronosequence of abandoned ionic rare earth element mine tailings”
9. Zheng Feidan and Zhao Chun-Mei “Bio-uptake of cerium oxide nanoparticles in the freshwater algae *Chlamydomonas reinhardtii*”
10. Zhu Shichen, Huot Hermine, Liu Chang, Guo Mei-Na, Liu Wen-Shen, Françoise Watteau, Geoffroy Séré, Jean Louis Morel, Tang Ye-Tao, Qiu Rong-Liang “Root development and

rhizosphere effects in ionic rare earth element mine tailings under different phytoremediation modes”

11. A. Denys, A-L. Auzende, M.-L. Doan, G. Montes-Hernandez, E. Janots “Fluid/rock experiments on allanite alteration: Insights on the mobilization of REE and HFSE during weathering”

12. Faustin Mandil, Robin Vallereau, Sophie Rivoirard “Recycling and Valorisation of Rare Earth-based magnets”

13. Chun-Mei Zhao et al. “Ecological risk assessment of neodymium and yttrium on rare earth element mine sites”

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