



## EUROPEAN PROJECTS

The Agronickel FACCE European project has been accepted, allowing the European network constructed over the last few years to be formalised. The selection is a real achievement for the LabEx and will be recognised in the assessment of RESSOURCES21. Three companies, including a start-up, are attached to the Agronickel project

## RECRUTEMENT

- Saeed FARROKHPAY, lecturer and researcher from the University of Queensland in Australia, was recruited in June 2015 on a 2-year contract.
- Eswaraiiah CHINTHAPUDI, senior researcher from the Minerals and Materials Technology Institute of Bhubaneswar, Odisha, INDIA, re-joined the RESSOURCES21 team in September 2015.
- Yoram TEITLER, from the Centre for Exploration Targeting at Perth in Australia, took up his post-doctoral position at the LabEx in October 2015.

## PRIZES



Lev FILIPPOV, researcher at the GeoRessources Laboratory and professor at ENSG, has been awarded the Society Medal by the Société de l'Industrie Minière, in recognition of his significant contributions to the Society's activities in terms of research into ore evaluation and recovery and the training of students for the mineral industry. The medal was awarded during the opening ceremony of the SIM congress, at Mons in Belgium on October 21st 2015.

## SEMINARS, MEETINGS AND CONFERENCES

SGA 2015 NANCY – Nancy played host to the SGA 2015 international congress on the theme of “Mineral Resources in a Sustainable World”, held at the Nancy Centre Prouvé congress centre from 24th to 27th of August. The congress brought together a diverse international scientific community, composed of researchers, university academics and industry and institutional partners, who met to discuss the latest research developments in mineral resources and their industrial and environmental impacts. The success of the congress was reflected not only in the science, but also in the number of participants, representing 60 different nationalities.



Science & You Forum - RESSOURCES21 took part in the Science & You Forum, helping visitors to the fair discover the different steps involved in the exploitation of metals, from exploration to their use in our day-to-day lives. In the “Sandbox” workshop, visitors were introduced to geophysics, drilling techniques and the protection of the environment. Crushing and separation techniques were demonstrated in the “Processing” workshop. Finally, the definition of the different properties of metals and how metals are used in everyday life were explained through the “Characterisation” workshop. A bonus workshop offered a chance to discover France's different geological regions through a series of clues and riddles. Photos of the event can be viewed at <http://ow.ly/NUaVj>

Québec Mines: As we say in France, everything was “nickel” from the 23 to 26 November 2015. In 2015, as every year for the past 4 years, a 5-person delegation answered the call, and this year saw François Turlin win the AQUEST 1st prize for his poster!



French Mirror Group – Mineral raw materials: LabEx RESSOURCES21, ERA-MIN, MENESR, MEIN and MEDDE joined forces to organise this assembly for French actors working on the theme of mineral raw materials. The meeting reunited all of the members of the various French mirror groups, including ERA-MIN, PEI-MP, CSF and KIC. The 1-day event took place on 25th of September at the Ministry for Higher Education and Research in Paris. Presentation of the NewOres project at the final ERA-MIN conference. The NewOres project, which was accepted in 2015, was presented by its French coordinator, Michel Cathelineau, at the ERA-MIN stakeholder conference in Berlin.

Manuel Munoz, lecturer and researcher at ISTerre in Grenoble, was invited to CRPG to give a seminar on the “Crystallochemistry and cationic markers of the serpentinisation process: analytical approach by synchrotron X-ray absorption spectroscopy”. The seminar was made possible through collaborations with Marie-Christie Boiron and Béatrice Luais in the context of the doctoral research of Rémi Bélistont. Manuel Munoz is also involved in the CNRT project on nickel and scandium in New Caledonia, in collaboration with Michel Cathelineau and Marie-Christie Boiron (GeoRessources Labex R21) and Marc Ulrich (IPGS-EOST, Strasbourg).



Biochar and mining soils seminars: a series of seminars on the use of biochar in mining soils was organised by LSE on the 17 September 2015. Thanks to support from the LabEx, four overseas researchers were invited to Nancy to present a synthesis of their most recent results on the topic, and notably to discuss the preparation of a potential new European research project. Around 40 people attended the seminars, giving them the opportunity to exchange questions, ideas and comments directly with the speakers.

The Terres Rares Québec conference in June 2015 was the setting for a rich sharing of ideas and experiences in the discipline, and led to many fruitful discussions as well as prospects for future collaborations with partners in Québec. Laure Giamberini, Anne-Sylvie André Mayer and François Turlin are currently holding meetings with various Lorraine partners regarding such possibilities.

## PUBLICATIONS

- Mineralogy of nickel ores: Cathelineau M., Caumon M-C, Massei F., Brie D. and Harlaux M. (2015) Raman spectra of Ni–Mg kerolite: effect of Ni–Mg substitution on O–H stretching vibrations. *J. Raman Spectroscopy*, DOI 10.1002/jrs.4746
- Nickel mineralisations in New Caledonia: Cathelineau M., Quesnel B., Gautier P., Boulvais P., Couteau C, and Drouillet M. (2015) Nickel dispersion and enrichment at the bottom of the regolith: formation of pimelite target-like ores in rock block joints (Koniambo Ni deposit, New Caledonia) *Mineralium Deposita* 07/2015; DOI:10.1007/s00126-015-0607-y
- Publication based on the LabEx post-doctoral research of Nicolas Estrade. Estrade, N., Cloquet, C., Echevarria, G., Sterckeman, T., Deng, T-H-B., Tang, Y-T., Morel, J.L. 2015. Weathering and vegetation controls on nickel isotope fractionation in surface ultramafic environments (Albania). *Earth and Planetary Science Letters*, 423, 24-25.
- Agromines/agromining: An article on agromines/agromining (terms first proposed by the LSE) had the honour of being featured on the cover of "ES&T" - Environmental Science and Technology. Antony van der Ent, the first author of the paper (an international collaboration), is a RESSOURCES21 post-doctoral research fellow at LSE. Alan Baker is a LabEx visiting professor and is also based at LSE. The LSE and LRGP laboratories also contributed to the article.

## SPOTLIGHT ON THE RESSOURCES21 DOCTORAL STUDENTS



Rémi Belissont - After obtaining his Masters from ENSG at the University of Lorraine, Rémi Belissont joined GEORESSOURCES and CRPG in the LabEx 2012-2015 class. Supervised by Béatrice Luais and Marie-Christine Boiron, his research focuses on the "Cycles of germanium and associated strategic metals in metallic concentrations: elemental and isotopic tracing and experimental approaches".

Jennifer Andrei - Having completed her Masters degree at the University of Bordeaux I, Jennifer Andrei joined LIEC in the LabEx RESSOURCES21 2012-2015 class. Sandrine Pain-devin and François Guérold are co-supervising her thesis project, entitled: "Effects of manufactured nanoparticles on freshwater invertebrates and their roles within ecosystems"



Maxime Faivre - A member of the LabEx RESSOURCES21 2012-2015 class, Maxime Faivre holds a Masters degree from the ENSG, University of Lorraine. Fabrice Golfier and Richard Giot from GEORESSOURCES are co-supervising his research, entitled: "Modelling the hydrogeomechanical behaviour of fault networks under variations in the state of stress".

Matthieu Harlaux - Having obtained his Masters from the ENSG, University of Lorraine, Matthieu Harlaux joined the RESSOURCES21 2013-2016 class to work on a research project entitled "Late-Variscan orogenic mineralisations of tungsten and associated metals (Sn, Nb, Ta): fluid and metal sources and relations with late-Carboniferous tectono-magmatic events in the deposits of the French Massif Centrale", under the supervision of Michel Cuney and Christian Marignac.



Gaëlle Mollex - The research of Gaëlle Mollex, doctoral student in the LabEx 2013-2016 class, focuses on the "Genesis, evolution and alteration of carbonatite magmas" and is supervised by Lydéric France of CRPG.

Emilie Perrat - Focusing on "The environmental impacts of gadolinium contrast agents: local situation and cellular and in vivo approaches", Emilie Perrat joined LIEC in the LabEx 2013-2016 class. Her doctoral research is co-supervised by Marc Parant and Carole Cossu Leguille.



Andrey Myagkiy - Andrey Myagkiy obtained his Masters at ENSG, University of Lorraine, before joining the GEORESSOURCES laboratory as part of the LabEx 2014-2017 class. His PhD research, supervised by Laurent Truche, Fabrice Golfier and Michel Cathelineau, focuses on the "Formation of Ni-saprolite mineralisations in New Caledonia: dynamics of metal transfers and coupled modelling".

Séverine Lopez - Having obtained a Masters degree in Environmental microbiology and health, Séverine joined the LSE laboratory in October 2015 as part of the LabEx 2015-2018 class. Her thesis research, conducted in the framework of the Nickel programme, is entitled "Determinism of the microbial communities structure in ultramafic soils on a context of nickel agromine" and is supervised by Emile BENIZRI and Jean-Louis MOREL.



Nicolas Grosjean - After graduating from the University of Lorraine with a Masters in BioMANE, Nicolas Grosjean joined the LabEx as part of the 2015-2018 class. Based at the LIEC site in Bridoux, his research, "Study of response genes to rare earths in model organisms", is supervised by Elisabeth Gross, Marie Le Jean and Damien Blaudez and is conducted within the framework of the Terres Rares programme.

François Turlin - François's research at the GEORESSOURCES laboratory, supervised by Anne Sylvie André-Mayer, focuses on "Magmatic REE deposits, tracers of growth processes and differentiation of the continental crust: the example of the Proterozoic orogenic province of Grenville, Québec". After obtaining a Masters from ENSG, François joined the Terres Rares programme as part of the LabEx RESSOURCES21 2015-2018 class.



Damien Parrello - Damien Parrello holds a Masters from the Paris Institute of Biothec. His PhD research, entitled "The use of luminescent-signal emitting genetically-modified bacteria (biosensors) for identifying biotic and abiotic parameters that induce the mobilisation of strategic metals such as nickel", was partially financed by the LabEx in 2013 and was supervised by Christian Mustin.

Pablo Herrera - After obtaining his Masters degree at the University of Lorraine, Pablo received partial funding from RESSOURCES21 in 2014 for his PhD project entitled "The use of 3D/4D geomodelling for estimating the mineral resource potential of a metallogenic province - application to the Kupferschiefers", supervised by Jean-Jacques Royer.



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