

What's happening at the Centre for Exploration Targeting...



DIRECTOR'S REPORT

Welcome to the spring 2018 CET Newsletter. This edition marks the first full CET Newsletter in several years and it highlights new activity and several notable accomplishments of CET staff and students in 2018. New energy and enthusiasm is evident amongst staff, students, industry members and government geoscience partners following the upswing in the global minerals industry. This energy has translated into several new high-impact projects, a few of which are profiled in this edition. Other new projects and people will be profiled in upcoming editions.



The next few weeks are going to be very busy at the CET. Over the weekend of 17/18 November, there will be a 30-year reunion celebration of students and staff from the original Key Centre for Teaching and Research in Strategic Mineral Deposits and successor Centre for Global Metallogeny (CGM). Both 'Centres' were led by Professor David I. Groves (aka DIG), who remains very active and regularly darkens the halls of the Robert Street Building. All past and present CET staff, students, and corporate members are invited to talks by young researchers currently studying at the CET on the afternoon of November 17th. These talks provide a cross-section of the innovative types of research now conducted at the Centre and a chance to mingle with old and new friends.

The final week in November will be a 3-day extravaganza of mineral geoscience at UWA. The annual CET Members' Day leads off on November 27th at the Wesfarmers lecture theatre at the UWA Business School. Following Members' Day is a CET-lead workshop on the "Application of Multiple Sulfur Isotopes to Mineral Exploration Targeting" on November 28th at the UWA Watersports Complex. The week ends with the inaugural GSA Earth Sciences Student Symposium (GESSS-WA) on November 29th at the Woolnough and Gentilly lecture theatres in the UWA Geology building.

On a personal note, I would like to thank everyone who has welcomed me back to UWA after so many years away. I graduated from UWA in 1994 with a Ph.D. done at the original Key Centre under the supervision of David and Neal McNaughton. So blame them for my science. It has been a bit of a whirlwind since my arrival in March and somewhat akin to 'drinking water out of a fire hose' as one colleague opined. Nevertheless, I have enjoyed the experience immensely.

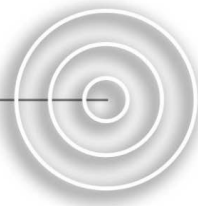
On behalf of our staff and students, I wish all of the CET members, partners and friends the very best for 2019. See you at Members' Day.

Professor Steve Rowins
CET Director

CET MEMBERS' DAY

CET UPDATE

Centre for **EXPLORATION
TARGETING**



The Centre for Exploration Targeting is pleased to announce the **13th Annual CET Members' Day** to be held on 27 November 2018 at the UWA Business School.

This year's program will include an overview by CET Director Prof. **Steve Rowins**, with an update on current and new projects for the CET in 2018 and beyond. Selected speakers will present highlights from active research projects, with a more comprehensive overview

Liam Casey - new
CET Coordinator

Guyue Hu - new
visitor working with

of Centre activities provided by research posters on display for the duration of the event.

Our keynote speaker is [Georges Beaudoin](#), Professor of Economic Geology in the Department of Geology and Geological Engineering at Laval University. Georges holds the NSERC-Agnico Eagle Industrial Research Chair in Mineral Exploration, where his team develops indicator mineral methods for orogenic gold deposits. He is also Director of the E4m Research Centre on the geology and engineering of mineral resources at Laval University.

Reserve your seat by 19th November 2018 by emailing Corinne Debat: info-cet@uwa.edu.au

Tuesday 27th November 2018
Wesfarmers Lecture Theatre,
UWA Business School, Crawley
[MAP](#)

PROGRAMME

08:15- 08:30 Registration

08:30 - 09:00 Steve Rowins [CET-UWA Director]
Overview of CET activities

09:00 - 09:30 Sandi Occhipinti [CET-UWA]
Mineral systems of the Capricorn Orogen: Lessons learned and future applications

09:30 - 10:00 Eun-Jung Holden [CET-UWA]
Data for discovery: Geological document analysis using a text mining approach

10:00 - 11:00 Morning Tea / Poster Display

11:00 - 11:30 Mark Jessell [CET-UWA]
The “Loop” Consortium and Minex CRC: What will 3D geological modelling look like in 2030?

11:30 - 12:00 Michael Tedeshi [CET-UWA]
Metallogeny of the Guiana Shield with an emphasis on the Karoumi gold project

12:00 - 12:30 Brent McInnes [Curtin University]
Applying geochemical innovation to exploration: The John de Laeter story

12:30 - 13:50 Lunch / Poster Display

14:00 - 14:20 Laura Petrella [CET-UWA]
Controls on high-grade gold mineralization at the world-class Callie deposit, Northern Territory, Australia

Alison Ord

EVENTS



[CET Breakfast](#)

Every last Thursday
of the month

7:00-8.30am

PLEASE NOTE: the
29th November 2018
Breakfast will be held
at the [University Club](#),
UWA

All welcome.

[CET Christmas Party](#)

Friday 7th December

Matilda Bay

Foreshore

3:00-6:00pm

Keep an eye out on
the [CET Events page](#)
for further
information.

[SES SEMINAR SERIES](#)

[Associate
Professor Shaun](#)

14:20 - 14:45 Steve Denyszyn [SES-UWA]
Uncovering new exploration targets using high-resolution
Geochronology

14:45 - 15:15 Marco Fiorentini [CET-UWA]
The metallogenic DNA of the continental lithosphere

15:15 - 16:00 Afternoon Tea / Poster Display

16:00 - 17:00 Georges Beaudoin [Laval University]
Indicator minerals for orogenic gold deposits

17:00 - 17:10 Steve Rowins [CET-UWA]
Closing Remarks

17:15 - 18:00 Sundowner

IN THE NEWS



The Rio Tinto and UWA Research Team

New partnership develops machine assisted geological modelling

A new four-year \$3.6 million research partnership between The University of Western Australia (UWA) and Rio Tinto Iron Ore will lead to improved efficiency in geological modelling, through innovative data science solutions.

Building on a collaboration that started in 2010, the new partnership, Data Fusion Projects, involves UWA's geodata algorithms team led by Professor Eun-Jung Holden and Dr Daniel Wedge working with Rio Tinto Iron Ore's team led by resource evaluation manager Thomas Green.

FULL STORY: <http://www.news.uwa.edu.au/2018102411062/new-partnership-develops-machine-assisted-geological-modelling>

[Barker](#)

The use of stable isotopes in exploration for carbonate-hosted deposits.

Monday 12th

November 2018

4:00-5:00pm

Woolnough Theatre,
Geology Building,
UWA

[Doctor Simon Lang](#)

Theme = Seismic
Geomorphology

Thursday 22nd

November 2018

4:00-5:00pm

Woolnough Theatre,
Geology Building,
UWA

[Curtin University](#)

[Geology Seminar](#)

Luc Doucet (Curtin
University)

Where (the hell) are
the oceanic large
igneous provinces in
the geologic record?

Wednesday 14th

November 2018

12:00-1:00pm

Room 312.222,
Bentley Campus,
Curtin University

UWA KEY CENTRE 30th REUNION



Thirty years ago, Professor David Groves founded the Key Centre for Teaching and Research in Strategic Mineral Deposits in the Department of Geology at the University of Western Australia (UWA). The 'Centre' as it was better known, was the first of its kind in Australia. It operated until 2004 when succeeded by the Centre for Global Metallogeny (CGM). Over the weekend of 17/18 November, there will be a 30-year reunion celebration of students and staff from the original Key Centre and successor CGM. On the afternoon of Saturday 17th November, the Key Centre and CGM alumni will meet at the Robert Street Building, to listen to three talks by young researchers currently studying at the CET. These talks will provide a cross-section of the innovative types of research now conducted at the Centre. We welcome current CET staff and students to participate in the Saturday afternoon activities, including attending these exciting geology presentations and mingling with past Key Centre and CGM staff and students. A schedule for Saturday's activities is outlined below.

Friday 16th November 2018

19:00: Arrive for informal get together at [Steves Nedlands](#) (30 The Avenue, Nedlands). Costs to be paid individually.

Saturday 17th November 2018

UWA-CET Lecture theatre, Robert Street Building
(the old General Purpose Building 2 - GP2)

14:00 Welcome Steffen Hagemann

14:10 CET Director: Steve Rowins

14:30 CET Board Chair: Jon Hronsky

[UWA Key Centre 30th](#)

[Reunion](#)

16th - 18th

November 2018

University of Western

Australia, Crawley

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[Complex Orebodies](#)

[AusIMM Conference](#)

Unlocking the future

mineral supply

needed for many of

the world's most

important

commodities is a

critical problem

affecting our industry.

AusIMM's Complex

Orebodies conference

will provide delegates

with a clear

understanding of the

nature of complexities

facing future

orebodies, address

complexity across the

mining value chain

and share practical

solutions you can

apply to your

operation.

40 leading global

experts will share

case studies across a

broad range of

commodities,

addressing the

challenges facing

future mineral supply

from technical, social,

14:45 Jordan McDivitt
Deformation, Magmatism and Gold Mineralization in the Golden Mile

15:15 Coffee break and group photo

15:45 Stefano Caruso
Multiple Sulfur Isotopes as Indelible Tracers of Ore-forming Processes in Archaean Mineral Systems

16:15 Tom Horrocks
Integrated Analysis of Geological, Geophysical, and Geochemical Data of the Kevitsa Ni-Cu-PGE Deposit: Machine Learning Approaches

16:45-18:00 Drinks & mingling with members, present staff, postdocs and Ph.D. students

18:00: Pre-dinner drinks and canapes at [Jo-Jo's Restaurant](#), Nedlands

19:00: Sit-down dinner at Jo-Jo's Restaurant, Nedlands
Please note: [Pre-booking and pre-payment](#) is required to attend the dinner.

Sunday 18th November 2018

10:00: Barbecue at Nedlands foreshore (location to be advised). Bring your own food and drinks.

Staff contacts: [Steffen Hagemann](#) and Linda Tompkins

16th - 18th November 2018
University of Western Australia, Crawley
[REGISTER](#)

MULTIPLE SULFUR ISOTOPE WORKSHOP

The Centre for Exploration Targeting at the University of Western Australia, in collaboration with Curtin University and Université Laval (Canada), invites you to attend a multiple sulfur isotope workshop on the 28th of November 2018 at UWA. The day is designed around informing researchers and industry about the latest advances on the characterisation of multiple sulfur isotopes as robust and indelible tracers of ore-forming processes. Experts from around the world will discuss the latest advances in the field and highlight future challenges and applications. Numerous case studies from Archean and Proterozoic mineral systems will be presented.

environmental and business standpoints.

19th - 21st November 2018

Brisbane, Australia

[REGISTER](#)

[13th Annual CET](#)

[Members' Day](#)

Tuesday 27th

November 2018

Wesfarmers Lecture

Theatre,

UWA Business

School, Crawley

[REGISTER](#)

[MAP](#)

[Multiple Sulfur](#)

[Isotope Workshop](#)

Wednesday 28th

November 2018

UWA Watersports

Complex

Crawley, WA

[REGISTER](#)

[Geological Society of](#)

[Australia Earth](#)

[Sciences Student](#)

[Symposium \(GESS-](#)

[WA\)](#)

Thursday 29th

November 2018

8:30am – 8:00pm

UWA Geology

Building - Gentilly and

Webb Lecture

Theatres

[REGISTER](#)

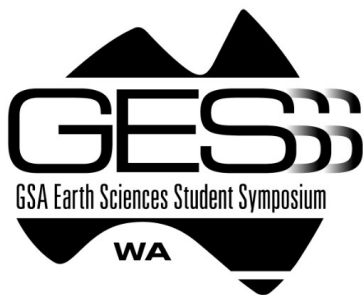
Application of Multiple Sulfur Isotopes to Mineral Exploration Targeting

Wednesday 28th November 2018

UWA Watersports Complex

[PROGRAMME](#)

GESSS-WA SYMPOSIUM



[Geological Society of Australia Earth Sciences Student Symposium \(GESSS-WA\)](#)

GESSS-WA is a one-day symposium aiming to promote collaboration between Students, the GSA, Universities and Industry in Western Australia. The event will allow for university students undertaking research at Western Australian institutions to present their findings to a wider scientific community and for sponsors to gain exposure to potential employees by means of representatives and prominent branding. The inaugural GESSS-WA will be held on the 29th of November 2018 at the University of Western Australia.

Students are invited to submit abstracts for presentations or the poster session across all fields of Earth Sciences, including Atmospheric and Environmental Sciences. Presentations will be either 5 or 15 minutes in length and students can submit multiple abstracts. Presentation and poster slots will be allocated by the GESSS-WA. The Symposium will run several themed sessions, with the formal schedule to be announced closer to the event.

Thursday 29th November 2018

8:30am – 8:00pm

UWA Geology Building - Gentilly and Webb Lecture Theatres

[REGISTER](#)

AWARDS

[11th Inter Guiana Geological Conference: Tectonics & Resource Potential of NE South America](#)

This conference brings together the partners of the AMIRA International P1061A Project-The South American Exploration Initiative with the 11th Inter-Guiana Geological Conference series.

The SAXI project aims to enhance the exploration potential of the Guiana Shield and neighbouring terranes in northeast South America through an integrated program of research and data gathering into its 'anatomy'.

There is an equally strong commitment to training and training by research to produce the next generation of local industry-aware geoscientists.

The Inter-Guiana Geological Conference was a long-standing conference series

Congratulations to CET Alumni **Yongjun Lu** (Geological Survey of Western Australia, Australia) on being awarded the **Waldemar Lindgren Award, 2018** by the Society of Economic Geologists. This award goes to an individual under the age of 37 in recognition of published research that represents an outstanding contribution to economic geology. The Society annually confers honours upon members of the geological profession and/or allied professions, who in the opinion of the Council have made outstanding contributions to the advancement of economic geology.



which brought together a generation of geoscientists interested in the region, and which is being relaunched at Paramaribo in 2019.

19th - 20th February 2019

Paramaribo, Suriname

[REGISTER](#)

[AEGC2019 -](#)

[Data to Discovery](#)

Australasian

Exploration

Geoscience

Conference

Perth will host the

2nd Australasian

Exploration

Geoscience

Conference (AEGC)

from Monday 2 to

Thursday 5

September 2019 at

Crown Perth.

2nd-5th

September 2019

Perth, Western

Australia

[REGISTER](#)

[World Gold Conference 2019](#)

The World Gold

Conference series is

a joint venture

between The

Australasian Institute

of Mining and

SEG UWA STUDENT CHAPTER



Members of the SEG UWA Student Chapter at their 2018 Leapfrog workshop

[Society of Economic Geologists UWA Student Chapter](#)

The SEG UWA Student Chapter provides opportunities to postgraduate and undergraduate students who are interested in Economic Geology. We strive to improve our geological skills, network with industry, and increase "boots on the ground" experience by learning about various deposit styles via our student organised field trips. This year our Student Chapter has organised talks, fundraising activities and workshops.

The Chapter held a Leapfrog 3D workshop, organised with the collaboration of Fremantle's Seequent team who kindly provided a 2-day course free of charge to students. The workshop got a full

house attendance and we learned skills on implicit 3D modelling thanks to our patient teachers Kathryn and Zoe.

We were also lucky to have Steve Garwin, our industry mentor, to present a talk on the "Discovery and Geology of the world-class Alpala porphyry Au-Cu deposit in N Ecuador", drawing a lot of interest. Jesse Clark's (BHP) "Olympic Dam: Unravelling the Giant" and Chris Voisey's (Monash) "Aseismic Refinement of Orogenic Gold Systems" talks were great and encouraging examples of the contributions that the young generation of geologists are bringing to both industry and academia.

A large cohort of our Student Chapter members participated in this year's SEG and Gordon conferences in the U.S.A., during which we connected with other SEG student chapters from around the world. Also, our President gave a talk to the Universidad de Concepcion SEG Student Chapter "Nazca" in Chile. We will continue to foster connectivity and team work with other Student Chapters for years to come.

Finally, plans for the rest of 2018 involve a field trip to the Bendigo-Ballarat goldfields in Victoria, followed by a tour to the world class IOCG Olympic Dam. This field trip is fully organised by our Student Chapter and will have participation from Rio Tinto and Anglo American geologists, as well as students from Monash University.

We are very thankful to the CET, our Patron Institution, and especially to our 2018 Sponsors who have made all of this possible:

- Rio Tinto
- BHP
- AngloAmerican
- CSA Global
- HiSeis
- Western Mining Services
- Geosborne

Many thanks, and looking forward to seeing you in 2019!

- Report from Nicolas Mériaud, PhD Student, CET

PUBLISHED PAPERS

Atmospheric sulfur is recycled to the crystalline continental crust during supercontinent formation.

- [Crystal LaFlamme](#),
- [Marco L. Fiorentini](#),
- [Mark D. Lindsay](#) &
- [Thi Hao Bui](#)

Nature Communications volume 9, Article number: 4380 (2018)
Access the Paper online

Metallurgy (The AusIMM), the Southern African Institute of Mining and Metallurgy (SAIMM) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).

11th-13th
September 2019
Crown Perth
Perth, Western
Australia

WORKSHOPS



[NHMRC Investigator Grants - Faculty of Science Workshop](#)

In preparation for the NHMRC Investigator round, the UWA Faculty of Science will be running a workshop which will provide an overview of the NHMRC Investigator Grant Scheme details. They will provide

at: <https://www.nature.com/articles/s41467-018-06691-3>

PHD COMPLETIONS

Heta Lampinen, 27th August 2018

Defining a base metal mineral systems footprint in the Edmund Basin of the Capricorn Orogen, Western Australia

The polymetallic ~1590 Ma Abra deposit is hosted within 1680-1450 Ma sediments and is concealed under thick weathered regolith. The deposit was investigated as a natural laboratory to define the size and geometry of multi-scale footprints associated with mineral systems. Deep crustal-scale basement structures beneath the deposit form a triple-junction that is overlain by a vertically zoned mineral footprint containing white mica, chlorite and carbonate. Hydrothermally altered overlying sediments indicate that deposit formed through sub-seafloor replacement. The mineral footprint of the deposit has been preserved through weathering and was mapped at the surface from ground-truthed remote sensing data.

CET PROFILES



Mr Liam Casey has recently joined the CET as Centre Coordinator. Liam has over 25 years of experience working within administration and management roles in tertiary education and the sports & leisure industry.

For the past 8 years Liam has worked as the Research Centre Coordinator at RMIT University's Centre for Applied Social Research in Melbourne. Prior to this position, Liam worked for several years as the Business Manager/Administrator at the Curtin University Sustainability Policy (CUSP) Institute in Fremantle. Both of these roles provide Liam with a wealth of experience for his new

insight into the application structure as well as some thoughts on how to approach the 'Research Impact' section of your application. There will be room for some discussion afterwards if needed.

Monday 12th

November 2018

2:30pm – 3:30pm

Barry J Marshall

Library

Jean Kahan Meeting

Room Level 3 302

UWA Campus

[REGISTER](#)

UWA Library

workshops:

The University Library offers a range of workshops and events for current students, researchers and other members of the UWA community.

Upcoming workshops include:

Copyright and Author Rights;

Using InCites for benchmarking;

Research Data Management -

Storage;

Sharing your research with the

position in the CET where he will be planning and coordinating a wide range of CET membership functions and staff engagement activities.

As part of his role, Liam is now the person responsible for the production of the quarterly CET eNews, so if you have anything you would like included in the February 2019 Edition, please email it through to liam.casey@uwa.edu.au



Eliza graduated with a Bachelor of Science and first class Honours from the University of Western Australia in 2011. Her thesis, entitled “The Nature and Timing of Gold and Base Metal Mineralisation in the Peak Hill District, Western Australia”, focused on the timing of gold mineralisation and associated hydrothermal alteration with respect to deformation and metamorphism in the Peak Hill District. It was during this project, in which the comparison between multiple gold and base metal deposits allowed for the determination of district wide mineralisation events, when Eliza began to appreciate the need for detailed studies that unravel the timing of mineralisation.

Between 2012 and 2015 Eliza worked as an exploration geologist for Newexco Services. She spent two years exploring for magmatic nickel sulphide deposits in the Forrestania Greenstone Belt, Western Australia, and lost count of the kilometres of drill core she (happily) logged. Then, after taking an extensive backpacking trip in 2015 and returning with a bag full of rocks to add to her unashamedly large rock collection, Eliza realised she was ready to commit to studying more rocks.

She joined the CET in 2016 to undertake a study on the petrogenesis of Archean and Proterozoic Iron Oxide Copper Gold (IOCG) and Intrusion Related Cu-Au systems in the Carajas Mineral Province (CMP) of Brazil. The CMP hosts the largest number of high-tonnage IOCG deposits in the world, with combined indicated and measured reserves of more than 2 billion metric tons of Cu-Au ore. It also hosts Ni-sulphide, Au-PGE and BIF related Fe mineralisation. The metallogenic diversity and metal endowment of the CMP had Eliza feeling so “ore-struck” that she had to be involved.

Eliza is currently working under the supervision of Professor Steffen Hagemann and Dr Tony Kemp of UWA and Professor Roberto Xavier of the University of Campinas, Brazil. The project aims to establish the timing of mineralisation and to determine the

world: The UWA
Research Repository.
[REGISTER](#)

PHD MATTERS



[Research Proposal
Seminar - Tasman
Gillfeather-Clark \[CET
PhD Student\]](#)

**Integrated analysis of
geophysics data for
iron ore detrital
deposits: a machine
learning approach.**

**Wednesday 7th
November 2018
12:00pm
CET Boardroom, UWA**

[Sandstone PhD
Questionnaire - Rhys
Samuel Davies \[CET
PhD Student\]](#)

**Sam is conducting a
study to estimate
residual gold**

relationship between metals (Cu, Au) and magmatism (i.e. if felsic magmatism provides the metals for mineral deposits or simply acts as a heat source) using U/Pb geochronology, Sm-Nd isotope systematics and trace element geochemistry on hydrothermal accessory minerals such as apatite and allanite.

AEGC2019

[AEGC2019 - Data to Discovery](#)

Australasian Exploration Geoscience Conference
Perth will host the 2nd Australasian Exploration Geoscience Conference (AEGC) from Monday 2 to Thursday 5 September 2019 at Crown Perth.

The AEGC is the largest petroleum and mineral geoscience conference in Australasia, and incorporates the West Australian Basin Symposium (WABS) and the ASEG-PESA International Geophysical Conference and Exhibition.

The event will be jointly hosted by the Australian Institute of Geoscientists (AIG), Australian Society of Exploration Geophysicists (ASEG), and Petroleum Exploration Society of Australia (PESA).

The theme for the 2019 conference is "Data to Discovery". The AEGC technical program committee has a focus on Geology, Geophysics, and Geochemistry and how these are applied in exploration for both Petroleum and Mineral systems in Australasia and the wider Asia-Pacific region. The conference has major sub-themes encompassing but not limited to:

- New technologies
- New information from old data
- Local understanding from regional context
- Workflows and methods that reduce cost/turnaround on projects
- Cross disciplinary co-ordination
- Case studies
- Interacting and communicating science to the wider community.

A vital component of the 2019 conference will be the inclusion of dedicated streams for Australian basins, discovery techniques, mineral mapping, and remote sensing applications.

2nd-5th September 2019
Perth, Western Australia

[REGISTER](#)

endowment of an exploration project, using the USGS Three-part Assessment as a template.

Sam has booked the CET Boardroom on the following dates where hard copies of his research questionnaire and supporting documents (maps, etc) will be provided should you wish to participate in the study (this typically takes 20-45mins to complete).

If you are unable to attend and would still like to participate, please contact Sam via

email: hyssamuel.davies@research.uwa.edu.au

Wednesday 14th
November 2018:
10:00am-12:00pm
Thursday 15th
November 2018:
2:00pm-4:00pm



Participants at the final Sponsors meeting for WAXI3

WAXI

The third stage of the AMIRA International West African Exploration Initiative (WAXI) came to a successful conclusion at the final sponsors meeting in Abidjan, Côte d'Ivoire in mid-October. The final meeting brought together over 70 representatives from the 13 industry sponsors, 11 geological surveys and 13 research and training organisations to review the highlights of the WAXI 3 research and training program, and to discuss the possible structure of a WAXI 4 program. The sponsors noted in particular the impressive outcomes from the Lasalle workshop held in August that developed three distinct models for the tectonic and metallogenic evolution of the West African Craton, and which were developed in sufficient detail to provide a basis for testing these ideas during WAXI 4.

The sponsors also congratulated the WAXI team for their training efforts over the last 12 years, which supported 95 student projects and led 36 technical short courses in the region. A video highlighting the training courses provided by WAXI can be viewed here: <https://www.youtube.com/watch?v=9JY-ymA4TZ0>.

The scientific results are now being written up for publication, and these will add to the more than 85 articles that the project has already produced. The major synthesis products include a new geophysically-constrained map for the southern part of the West African Craton, a harmonised stratigraphy for the same region, a new 3D geological model, a Geodynamic Atlas allowing users to extract time slices from the major datasets, as well as the aforementioned tectonic models.

The WAXI program forms part of a new initiative at UWA to drive Australia-Africa research and innovation with the hope of improving life in both continents, which was launched in September by The University of Western Australia. The Africa Research & Engagement Centre (AfREC), announced during the Australia Africa Universities Network (AAUN) Annual Forum, will drive new initiatives and ethical collaborations between Australia and Africa and draw upon the important knowledge, ideas and experiences of growing African-Australian communities. The Centre will work with multiple industries across a wide range of research disciplines including agriculture, mining, law, public policy, international development, environmental science, engineering, archaeology and heritage, population health, biological science, history and economics.

For more information on plans for the WAXI 4 program, please contact Mark.Jessell@uwa.edu.au. To learn more about AfREC at UWA please visit <https://www.afrec.uwa.edu.au/>.



SAXI

Following on from the successful AMIRA International West African Exploration Initiative series of projects, the CET recently launched the AMIRA International South American Exploration Initiative with 9 industry sponsors, the Guyana Geological and Mining Commission and several university partners from France, Brazil and Suriname.

Specifically, the research team aim to:

- Assist exploration companies in focusing their activities in areas of maximum prospectivity in both greenfields and brownfields areas, and consequently help them to leave an environmental impact as small as possible
- Assist local governments and Geological Surveys in the region in their role of providing pre-competitive data and information in order to further stimulate inward exploration investment
- Identify data and information gaps, in particular in geophysics, geochemistry and geochronology
- Collate the results of the initiative into a single database open to all sponsors and local researchers.

The stage 1 project will be completed early next year and will include the organisation of the 11th Inter Guiana Geological Conference: Tectonics & Resource Potential of NE South America in Suriname, the 19 - 20th February 2019. This conference brings together the partners of the AMIRA International P1061A Project-The South American Exploration Initiative with the 11th Inter-Guiana Geological Conference series. This conference offers the opportunity for companies, geological surveys, development agencies and researchers to define key future research and training activities that will ultimately provide not only new geological information but also a new geological framework and exploration insights.

For more information on the SAXI project, please contact Mark.Jessell@uwa.edu.au and visit:

<http://saxiproject.org/> and for details of the conference, and links to registration information, see:

<http://www.cet.edu.au/education-and-training/short-courses/tectonics-resource-potential-of-ne-south-america-conference>



L[∞]p/MinEx CRC

The L[∞]p consortium, founded as a OneGeology initiative led by Laurent Allières at Monash University, with geosurvey and Australian Research Council support, brings together geological surveys, the CET and other research institutions in Australia, Canada, France, Germany and the UK to found a new Open Source initiative to build the next generation of 3D geological modelling tools. In addition to OneGeology and associated ARC Linkage funding, the University of Western Australia is a partner in the MinEx CRC, and leads the Automated 3D Geological Modelling stream in this major new undertaking.

The project aims to:

- integrate all available data in the modelling process,
- develop enabling technologies that will combine probabilistic modelling with structural concepts to
- produce 3D structural geological models (integration of geological rules in the modelling workflow), and
- assess and characterise uncertainty throughout the modelling workflow in order to optimise data acquisition for future maximised uncertainty reduction.

L[∞]p is a new platform (proposed workflow show in the following diagram) that will enable field geologists, researchers from academia and government organisations, explorers, resources modellers & managers to better define their 3D geological environment as well as assessing the requirement for optimised additional data/knowledge acquisition. The platform will be Open Source, scalable and applicable to problems from the mine scale to the plate scale, in data rich and poor environment. It will serve to solve problems related to urban geology, basins resources exploration and exploitation as well as minerals and scientific exploration in poly-deformed metamorphosed terranes.

The MinEx CRC is a \$218 million research collaboration aimed at developing technologies to increase the discovery of new mineral deposits, will was launched the 15th of October in Adelaide by the Hon Dan van Holst Pellekaan MP, Minister for Energy and Mining. The MinEx Cooperative Research Centre (MinEx CRC) has secured \$50 million in Federal Government CRC funding, as well as strong industry and research backing. Participants include 34 partners from the Mining Equipment, Technology and Services (METS) sector and major miners BHP, South32, Anglo American and Barrick committing \$165 million (cash and in-kind) over the next 10 years. Research organisations supporting the CRC include CSIRO, Curtin University, the University of Adelaide, the University of South Australia, the University of Western Australia and the University of Newcastle, together with Geoscience Australia, and all the Geological Surveys in Australia, with significant contributions from New South Wales, South Australia and Western Australia.

For more information on the L[∞]p project, please visit <http://loop3d.org> and for details of the Automated 3D geological modelling MinEx CRC project, please contact Mark.Jessell@uwa.edu.au or Mark.Lindsay@uwa.edu.au and for further information on the MinEx CRC visit <https://minexcrc.com.au/>

Ph.D. and Post-Doctoral position: genesis of gold mineralization in the Yamarna greenstone belt

The Centre for Exploration Targeting (CET) in the School of Earth Sciences at the University of Western Australia is a leading research centre in mineral system science applied to ore deposits. The CET provides a dynamic learning environment where the pressing problems of the mineral exploration industry can be addressed by teams of researchers using their collective expertise. This multidisciplinary team approach allows the CET to develop innovative research solutions consistent with its mission 'to increase both the rate and quality of discoveries made in mineral exploration, without relying on substantial increases in exploration expenditure'.

The CET is leading the 3-year 'Yilgarn 2020' research project with the support of the Minerals Research Institute of Western Australia (MRIWA) and various industry, academic and government partners. The project has three integrated research modules that will enhance our understanding of the metallogeny of the Archean Yilgarn Craton. The first module uses existing geological data to examine the composition and evolution of the lower crust and lithospheric mantle. The second module focuses on understanding camp-scale crustal architecture by developing criteria that can be applied to identify, rank and target the critical fluid focussing structures within a given camp. The third module examines the metal fertility of the Craton by examining how magmatic and metamorphic processes have contributed to the formation of the mineralized camps.

We are seeking applications from highly enthusiastic and motivated individuals to fill two positions in module 3. Specifically, researchers will examine the genesis of gold mineralization in the Yamarna greenstone belt, including the large Gruyere gold deposit.

1. Ph.D. position: A M.Sc. or first-class honours degree is required with fluency in English as a minimum language requirement. A background in economic geology, petrology and tectonics is desirable. The project will involve both remote field and laboratory work (microprobe, SEM, laser ablation ICPMS, radiogenic isotopes). Domestic Ph.D. candidates should apply for a UWA postgraduate scholarship (<http://www.scholarships.uwa.edu.au/future-students/postgrad/domestic>) whereas international candidates should apply for an Australian Government International Research Training Program (RTP) Fee Offset Scholarship (<http://www.scholarships.uwa.edu.au/future-students/postgrad/international>).

2. Post-doctoral position: A researcher with expertise in geochronology, and stable and radiogenic isotope geochemistry, including an interest in the innovative application of these data to understanding magma generation and crustal evolution. A high level of technical competency in microanalysis, especially with ion microprobe and/or laser ablation ICPMS platforms is essential. Familiarity with Archean geology and metallogeny is desirable. The post-doctoral fellow will be closely involved in supervision of the Ph.D. student. The position is for three years.

Both research projects can commence as early as March 2019.

APPLICATIONS

Applicants are asked to provide:

- a CV (including name and contact details of two referees)
- a cover letter specifically outlining your (a) expertise in geochronology, and stable and radiogenic isotope geochemistry (b) technical competency in microanalysis, especially with ion microprobe and/or laser ablation ICPMS platforms (c) familiarity with Archean geology and metallogeny and (d) experience in supervision of postgraduate students or teaching.

To apply or for further information, please contact Associate Prof. Tony Kemp (tony.kemp@uwa.edu.au) for the post-doctoral position, and Prof. Steffen Hagemann (steffen.hagemann@uwa.edu.au) for the Ph.D. position. For additional information on the Yilgarn 2020 project, please contact CET Director, Prof. Steve Rowins (steve.rowins@uwa.edu.au)

The next edition of the CET eNews will be out in February 2019. If you have anything you would like to share with the CET community, please email liam.casey@uwa.edu.au



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