Volume 3, Issue 3

December 2017

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1. A word from the new president

As the Christmas holidays are quickly approaching, it is time for the final IAHR Cardiff Young Professionals Network's (YPN) newsletter of the year. When we look back at the previous year, it seems like not much has changed but still a large number of things have. Similar to every academic year, the HRC has had an influx of new PhD students coming from different universities and countries. We also had to say goodbye to some dear people that have followed their carrier paths elsewhere.

In the last year, YPN was very motivated to encourage more public engagement and create stronger ties between industry and other schools within the university. A great deal of things have been achieved and our network has expanded in a number of very positive directions.

In the previous year, the YPN has been very involved in linking with other Early Career groups within Cardiff University and is very proud of the links made with the Water Institute and the Earth Early Career group, the related research groups in the schools of Biosciences, Earth and Ocean Sciences.

The YPN was also very focused on improving the connections with industry. A mini presentation event was organised together with CIWEM in which number of people working for large engineering companies including Welsh Water and Aecom, presented some of the interesting project they were recently involved in.

We were also very focused on public outreach in the past year taking part in several STEM events. YPN members were involved in few school visits and encouraged others in the postgraduate student community to also take part. Connections between outreach representatives at the university and the YPN are now very well established.

As with every year, the new YPN Cardiff committee has been elected and roles are as follow:

President

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WISE Representative/Treasurer

Joe Shuttleworth

ShuttleworthJD@Cardiff.ac.uk

As the new committee, we would like to say a big thank you to the previous committee members, especially last year's president Jonathan King.

The YPN committee has discussed and set some new goals for this academic year. It was decided that some useful workshops open to all YPN members will be organised. The idea is to offer the members some insight in software such as TEC-PLOT and Hec-Ras. We were also hoping to expand our links with other early career groups in other universities around the UK. The committee also planned to organise a mini conference event in collaboration with CIWEM and ICE. Hopefully this will provide opportunity to learn more about the industry and expand our membership list. The main idea is to improve links with industry and provide networking opportunities for all YPN members through gaining knowledge about innovative projects from both research and industry.

The contents of this newsletter include reporting from NERC fellowship workshop that was partly organised by the YPN, STEM and other public outreach reports, mini-conference event organised by the YPN in association with WISE hosted in Cardiff School of Engineering and an update from alumni about their current careers and project involvement concluding with the entertainment section.

On behalf of the new committee I warmly wish you all a merry Christmas and best of luck for the New Year.

--Filipa Adzic

2. Events

STEMLive: Mission 2 Mars

18/10/17

The Hydro-environmental Research Centre (HRC) at Cardiff University recently took part in a STEMLive event, as part of a larger team from the School of Engineering, at the National Museum Cardiff.

The purpose of the STEM event was to introduce approx. 120, year 5 & 6 children from local schools to Science, Technology, Engineering and Mathematics, or STEM for short, through numerous hands-on activities. All the activities, which ranged from Nerf Rockets to generators and solar panels, were developed with a central theme in mind; a Mission 2 Mars. The idea was that the children would spend 20 minutes at each activity station learning about the numerous problems associated with successfully landing on Mars and the technologies that could overcome them. Actors dressed up in space suits helped to co-ordinate the day and add to the excitement and realism for the children.

The HRC activity for the mission utilised our Augmented Reality Sandbox equipment previously discussed in Volume 3, Issue 1, May 2017 edition of the IAHR Cardiff YPN Newsletter. Our activity centred around how to choose a landing site on Mars and the factors that influenced such a decision such as the terrain, sunlight levels and the likelihood of finding water. As you might be aware, humans are yet to find water on Mars, but many scientists have theorised its existence based on satellite imaging, mineral formations and topographic similarities with earth. Therefore, the AR Sandbox equipment was extremely useful in provoking discussion on how features, such as canyons, hills and craters, which are visible on satellite images, might have been created on Mars given how they were created on Earth. To aid the visualisation the colour scheme for the Sandbox's topographic overlay was changed to feature black, grey, yellow and red as opposed to more earthly green and brown.

In providing this activity the HRC learned how to use the AR Sandbox for a different application than which it was intended, whilst also having a great opportunity to showcase the School of Engineering and STEM subjects.

The day proved highly successful with many children commenting on how they would like to engage in STEM careers in the future. Everyone just wished they had longer to learn about all the different activities!

For more information please visit: https://arsandbox.ucdavis.edu/ or contact Alex Stubbs, stubbsa1@cardiff.ac.uk.

Alex Stubbs, Claudia Peppicelli, Debbie Syrop and Dr. Bettina Bockelmann-Evans

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02/11/2017

Museum after Dark

On Thursday 2nd November the National Museum of Wales in Cardiff opened its doors to the public for an evening with the purpose of engaging both children and their parents in subjects relating to the sciences. The children were able to sample a wide range of activities including straw skeletons, laser harps, rockets, wind tables, bioluminescence and painting with light. Parents were able to sit in the café and enjoy refreshments as well as partake in the activities.

Three of the YPN's Committee members were able to assist with the event. Ben and Stephen were 'science busking': using water bottles, slinkies, whirly tubes and balloon helicopters to captivate an audience while demonstrating simple scientific principles. Also Giovanni was demonstrating the principles of sound waves using a guitar.

Overall the event was very successful with over 1200 people turning up throughout the evening. The children appeared to thoroughly enjoy themselves and it proved and excellent opportunity to promote STEM subjects.

-- Stephen Clee

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Applying for NERC Fellowships: Who, What, Why?

14/11/2017

On the 14th November Cardiff's YPN teamed up with the Earth Early Career Group and the Water Research Institute to organise a workshop focusing on applying for NERC fellowships. The Natural Environment Research Council (NERC) is the UK's leading public funder of environmental science. It supports over a thousand research projects in 55 universities and 20 research institutes.

NERC fellowships are highly competitive with only 9% success rate, mainly due to a very high average proposal cost of £500k. These fellowships require complete commitment to an academic career and innovative research ideas.

The following information was provided by Dr Mari Nowell who gave a great overview on NERC fellowships.

Who Can Apply?

These fellowships are open to anyone who has completed a PhD. In general applicants are expected to have an extensive and impressive publication list. So, although there is no minimum amount of post-doctoral experience, successful applicants often have some. Maximum post-doctoral experience should not exceed 8 years.

How to apply?

The application process consist of 2 stages: the sift stage and the interview stage. Only about 25% of

applicants make it to the interview stage so the sift stage is extremely important. Applicants are required to submit their proposal form through JeS online system. Proposal should consist of:

Document/attachment type	Requirements
Proposal Form	**JeS** proforma
Case for Support	10 page max ~2 page Previous track record ~8 page case for support
Outline Data Management Plan	1 page max
Justification of Resources	2 pages max
CV	2 page (only for fellow)
Publication List	No page limit
Letters of support	Outside collaborators - 2 page max LoS Internal collaborators don't need LoS
Pathways to Impact	2 page max
Head of Dept. statement	Mandatory

If the applicant has progressed to the interview stage there is a very good chance that they will be awarded a fellowship. The interview usually consists of a short talk to the panel followed by questions about the research. A large number of candidates re-apply if they have had an unsuccessful application in the past.

School support is available in Cardiff University and most other institutions. The applicants are strongly urged to get in touch with their division leader and school research office. The school research office can help identify potential funding sources, give support with drafting the application, help prepare costing, arrange internal peer review and give general advice.

(Cardiff University School of Engineering support contact: ENGINResearchGrants@cardiff.ac.uk)

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Applicants Perspective

Dr. Mark Cuthbert is a part of Earth and Ocean Sciences department at Cardiff University and was invited to give an overview of the application process as a current NERC fellow. He was able to provide some very objective and precise advice about every stage of the application process. It was emphasised that proposal failure is often a part of one's academic career and applicants should not take it personally, especially considering that Dr. Cuthbert had both unsuccessful and successful applications in 2014 and 2016 respectively.

When it comes to writing the proposal, applicants are advised to be as thorough as possible. To include any risks, a detailed plan for the whole 5 years and if possible any preliminary data should be included in the proposal.

At the interview stage, the applicant should draw out specific review concerns and counter them strongly and confidently. The big picture and impact of applicants' research should be emphasised as much as possible.

Overall he said that being confident and having a clear vision is very important.

Sift and Interview Panel Members Perspective

Professor Peter Kille was a Panel C Fellowship Sift and Interview Panel member in 2014 and 2015 and was happy to offer some general advice to potential candidates. The panel will look for specific qualities in applicants. The proposal should include all technical details, but applicants are advised to add a personal touch to the applications. The vision of research and its impact on the science community should be clear, and the proposal should show
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critical thinking and not be close ended. Examples of leadership in science and community are very much expected from all applicants. Professor Kille emphasised how important it is to identify support structure and people at the institution you chose.

Chair of NERC Fellowship Panels Perspective

Professor Lynne Boddy was a chairperson of NERC fellowship panels for a number of years and has recently retired. She offered advice on what qualities are looked for in the applications. Professor Boddy made it clear that excellent track record at current level is of the utmost importance. A successful applicant should provide evidence of independence and leadership and should have a good project idea.

--Filipa Adzic

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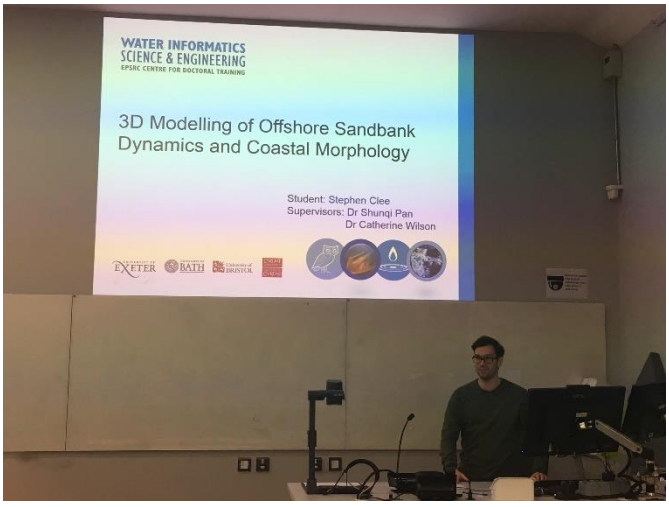
24/11/2017

Micro-presentation Event

After the big success of past year events, The IAHR YPN Cardiff committee have organised its second micro-presentation event on the 24th November 2017 in collaboration with the WISE CDT. The 5 minute 'elevator pitch' format has been kept in order to give a quick but intense overview of various research areas within the field of hydraulics. This involved six speakers, who have for close to two hours, exposed their projects and interests from coastal and turbines numerical modelling to computing hydrology, water management and sewer flood modelling.

After the President's welcome, the presentation session started with the first speaker Bin Guo, a PhD student at Cardiff University. During his presentation, Bin has summarized its research project "Hydrodynamic Modelling around Island/lagoon using TELEMAC 2D/3D and detailed some of the recent results obtained from his model.

After a short Q&A session, the second speaker entered the scene. Stephen Clee, PhD student at Cardiff University and part of the WISE CDT program have presented the last update of his project "3D modelling of Offshore Sandbank Dynamics and Coastal Morphology".



Both Bin and Stephen have showed very promising calibration results of their models.

The following speaker, Joe Shuttleworth, also a PhD student at Cardiff University on the WISE CDT, have given to the audience an overview on his research "Modelling Extreme Flow conditions". During his presentation, Joe have explained the importance of using models that include shock
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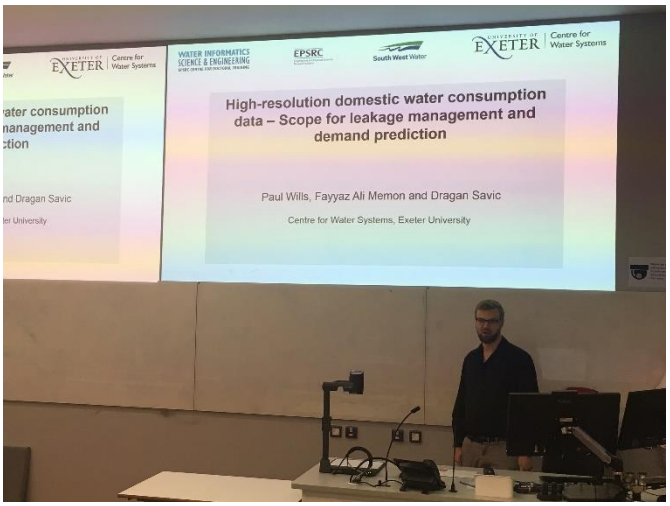
capturing algorithm in order to have good results in simulating floods.

Stephanie Muller, a new PhD student on the WISE CDT program was the next presenter. She offered an overview of her masters thesis work; "Numerical Investigations of the flow in a fish-friendly weir". These topics have clearly demonstrated the wide diversity of potential subjects in hydraulics, whilst highlighting that environmentally sustainable solutions are increasingly needed and vitally important in water engineering.

Next Paul Wills, another PhD student on the WISE CDT program based at the University of Exeter illustrated his research project "High resolution domestic water consumption data - Scope for leakage management and demand prediction" with a very comprehensive presentation, explaining the importance of a good leakage management in order to save water, energy and offer a better service to the consumer.



For the last talk of the day, our industrial member Arshan Iqbal have presented his work 'Radar Rainfall forecasting for sewer flood modelling to support decision making in sewer network operations' for a longer talk of 20 minutes. Arshan has recently started to work in AECOM after completed his PhD at the University of Exeter. This method showed a new possible approach in sewer flood modelling. The results of this novel advanced method are very promising and stimulated great interest from several companies with the aim to commercialise it in the near future.

This micro-presentation event was also an occasion to welcome various people from different backgrounds and current activities. In this way, the committee is proud to welcome a new industrial

member, Andrea Villar, a young professional Engineer who has recently started to work for Dwr Cymru/Welsh Water.

-- Giovanni Musolino & Benjamin Beylard

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3. Our Alumni

Thanasis Angeloudis, Imperial College London

It is a pleasure to contribute once again to the HRC's YPN newsletter. As a Cardiff University alumni and a former research associate I have many fond memories of the centre as well as friends and colleagues that I collaborate with to-date. Over the years the civil engineering hydraulics expertise in the HRC has been highly competitive, as demonstrated by it's established reputation in the field. Following my post-doctoral studies at Cardiff, I have focused on marine energy optimisation at the Department of Earth Science and Engineering of Imperial College London, initially as an EPSRC Research Associate and currently as a NERC Industrial Innovation Research Fellow. My research on that front relates to PDE-constrained optimisation along with coastal and environmental modelling associated with tidal energy options across the UK and beyond. There are enormous challenges associated with marine energy and coordinated studies on feasibility and optimisation of tidal technology designs and operations are indispensable for the success of the industry. In fact, this is an area where UK institutions have been leading the way for some time. Nonetheless, the current uncertainty associated with marine energy reliability and investments renders hydro-environmental research crucial in ensuring that the right modelling tools are applied to pave the way for the provision of large-scale marine energy to the electricity grid.

4.Future Events

Mini conference event focusing on current projects in industry – March/April 2018

HEC-RAS basics workshop – February

Social events weekly starting from mid-January (TBC)

5. Publications

1. Ouro P, Wilson CAME, Evans P, Angeloudis A. Large-eddy simulation of shallow turbulent wakes behind a conical island. Accepted in Physics of Fluids.

2. Ouro P, Fraga B, Viti N, Angeloudis A, Stoesser T, Gualtieri C. Instantaneous Transport of a Passive Scalar in a Turbulent Separated Flow. Accepted in Environmental Fluid Mechanics.

3. Ouro P, Stoesser T. Wake Generated Downstream of a Vertical Axis Tidal Turbine. 12th European Wave and Tidal Energy Conference. Cork, Ireland. 2017

If you wish to request more information about the newsletter, please contact to:

- Filipa Adzic (President): AdzicF@Cardiff.ac.uk
- Stephen Clee (Vice President): CleeSA@Cardiff.ac.uk
- Benjamin Beylard (Secretary): BeylardB@Cardiff.ac.uk
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6. Entertainment Section

A wife asks her husband, a software engineer: "Could you please go shopping for me and buy one carton of milk, and if they have eggs, get 6!" A short time later the husband comes back with 6 cartons of milk. The wife asks him, "Why the hell did you buy 6 cartons of milk?" He replied: "They had eggs."

A pessimist looks at a glass of water and states it is half empty, an optimist looks at the same glass and states it is half full, but an engineer sees it and states the glass is twice as tall as it should be.