

## Introduction

Please allow me, first of all, to thank you all for your kind emails, telephone calls and other signs of compassion during my absence in the past few months because of my collar bone fracture. Some help of experts was needed to get the desired self-healing process started. Officially I'm back in the office for 80% and I hope this will be 100% soon.

Many of us were very busy in the past few months with preparing and the submission of research proposals for Horizon 2020. Meanwhile we have been informed that some of these proposals have past the first round. Let's hope that some of them will finally be granted. Many of you have also been active in the organisation and preparation of the 1<sup>st</sup> International Conference on Ageing of Materials & Structures, AMS 2014, held in Delft in May. Thanks!

On 10 and 11 April EURO'14 was held. This workshop ended with the farewell lecture of prof. Michiel Haas. Thanks a lot, Michiel, for your contribution to the section in the past 6 years and all the best for the future!

Also in April a two-day IS2C workshop was held in Huizen. In this workshop PhD students presented the progress of their work in front of colleagues and members of user groups. More about this event in this M&E News.

In June, the yearly Concrete Microscopy Course was held. Again a success. Also in June, Bin Hu defended her PhD thesis. Congratulations! At least three PhD-candidates are scheduled to defend their thesis later this year: Haoliang Huang, Branko Savija and Hooman Hoornahad.

Zhengxian Yang was awarded "the National Award for outstanding Self-financed Chinese Students Study Abroad 2013". Read more about it in this edition. Congratulations!

On the 10<sup>th</sup> of September Peter Rem will give his inaugural speech in the auditorium. Don't miss it!

So far a few highlights, but there's more. Therefore I invite you to read this edition of the M&E News.

Many of us will soon go out for the summer holiday. Enjoy it! Some of use, mostly the overseas PhD students, will not take a break, but try to make progress with their project. Hold on & success!

Best regards,  
Klaas van Breugel

## UPCOMING EVENTS

### Microlab colloquium

by Tianshi Lu  
28 August 2014

### MMC

Beijing, China  
12 – 14 October 2014

### SHCC3 Delft

Dordrecht  
3 – 5 November 2014

### Defense Branko

27 October 2014

### Defense Haoliang

17 November 2014

### Defense Hooman

5 December 2014

### Cursus Opgelegde Vervormingen

9 – 10 April 2015

### IS2C

23 – 24 April 2015

### EMABM-15

Delft  
16 – 19 June 2015

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## Defense Bin Hu

June 3rd, Bin Hu defended her thesis on polymer recycling in magnetic liquids. A nice discussion developed when Prof. Hordijk asked Bin how tape can be fundamental to innovative research. Bin pointed out that researchers often wait a long time for the construction of their experimental set-ups before they can test their models and concepts, whereas with the help of tape they can do a quick investigation to find out if they are on the right track. She added that Nobel prize winners Geim and Novoselov used tape to extract graphene from their samples. Prof. Hordijk said that he would buy a roll for himself at the first occasion.



## M&E Summerparty

Last June we had the annual Summer party of our section. Instead of the usual dinner we arranged some teambuilding activities prior to the BBQ. The participants were divided into teams in advance, so that colleagues that usually don't spend time together got the opportunity to connect.



## Project Ecuador

In 2012 a group of four secondary students finished their end-of-the-year project at our section. As many other groups they were enthusiastic about our research and therefore chose the Microlab for their project. But this group in particular had a very good idea in mind: they wanted to apply self-healing concrete for irrigation canals in Ecuador. They heard from a former colleague of the father of one of the students that some canals in Ecuador had problems with cracking and leaking. They were an outstanding group, which was proven again when they participated in a yearly contest called 'Imagine' and won!

As first prize they received plain tickets to go to Ecuador and apply their ideas. Henk and Virginie who supervised the students in their project, asked Lupita to join, because she finished her Bachelor in Ecuador. Lupita contacted the 'Universidad Catolica de Santiago de Guayaquil' to ask them for help with this project. The researchers from the University responded very enthusiastic to the idea and arranged funding from the 'Ecuadorian National Science Foundation' to further develop this project. In conjunction the Universities decided to use natural fibres together with healing agent to improve the concrete, control the crack widths and assure the crack healing. The chosen fibres were Abaca, indigenous to Ecuador. The University in Guayaquil also has plenty of experience with this fibre. Walter Mera Ortiz, vice-rector of the University in Guayaquil spent a month in Delft in 2013 to exchange knowledge about the Abaca fibres and self-healing.

The end of this week, the 12<sup>th</sup> of July, Henk, Virginie, Lupita, Lotte van de Berg (Imagine Foundation) and the four winning students are flying to Ecuador to make this project come true. This will be the first field application of self-healing concrete. The group will first spend two days at the University in Guayaquil to fine-tune the concrete mixture, interact with colleagues from the University and Holcim Ecuador, who will sponsor this project. After that, the group will move to a valley, high in the Andean Mountains, to cast a piece of irrigation canal with self-healing concrete. The farmers who use the water from the canal will also be part of the project as they volunteered to help with the materials and handwork.

## IS2C-14 Workshop



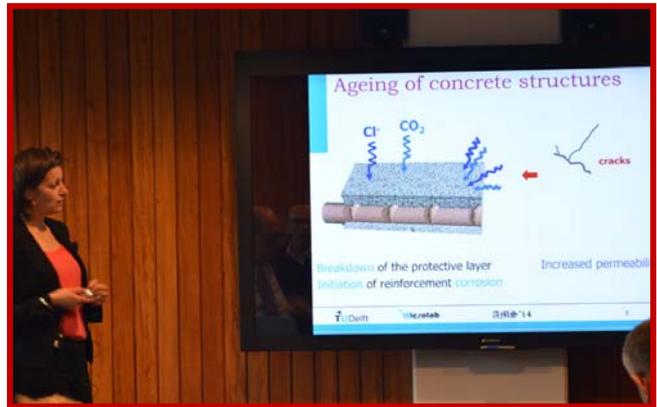
After the official kick-off in 2011, this year for the third time the IS2C workshop was organised and took place in Huizen, in the beautiful Kalk-ovens conference center. Part of the IS2C workshop was an excursion to the 'Hollandse Bridge' and several hands-on activities were organised where PhD students were divided into three groups to elaborate a task. This year the task was to develop a SIMLIFE-model, which is the acronym for 'a predictive Simulation Model for Service-Life assessment', which is the main objective of the IS2C-program.

## AMS-14

From the 26th until the 28th of May the '1st International Conference on Ageing of Materials & Structures' was held in Delft. It was the first international event initiated by the Ageing Center of the Delft University of Technology. Over 100 participants from almost 20 countries and from completely different fields attended this conference. We have seen excellent key-note lectures, one of them given by dr. Sanjay Pareek, who joined our group for one year during his sabbatical leave in 2012.

This first international conference was, as we call it, a path-finding event. Even though ageing is an issue in many engineering fields, it turns out to be a tough theme. This, however, is a challenge rather than a problem.

Even though AMS-14 was an event of the Ageing Centre and not of the section M&E, the organisation was in the hands of Iris Batterham. Eddie Koenders, who took over, in a way, Herdis Heinemann's role in the Ageing Centre, was crucial for compiling the technical program. This turned out to be a strong team. Perfectly organised and smoothly executed, not in the least because of the indispensable help of many PhD students. Well done, thanks!



For pictures of the event, see the website (<http://www.citg.tudelft.nl/actueel/congressen-en-symposia/events-materials-environment/ams14/photostream-ams14/>)



## CMC 2014

The 2014 edition of the annual 'Concrete Microscopy Course' (CMC) has been organized between June 2<sup>nd</sup> and June 6<sup>th</sup>. This year, we had the pleasure to have our Dean Prof. Bert Geerken to give the welcome speech.

The CMC is a unique course on the use of microscopy in characterization of cementitious building materials. In this course we teach the participants optical and electron microscopy, microanalysis, specimen preparation and the importance of multidisciplinary forensic research in the field of construction materials. This course has been organized since 2007 which has attracted numerous PhD students, academicians and industry professional from all over the world. The course is also supported by RILEM.

The popularity of this course has further increased in the recent years and this year, for the first time, all 11 participants attended the course from institutions outside section M&E, namely from the USA, Belgium, Turkey, Egypt and of course from the Netherlands. This year, our guest lecturers were Dr. Hong Wong from the Imperial College, UK and Dr. Per Hagelia from NPRA, Norway. The M&E teaching team was: Oguzhan Copuroglu, Erik Schlangen, Josepha Kempl and Jose Pacheco.

### Did you know?

*Delft is the home of infamous Antonie van Leeuwenhoek, a polymath, city officer and the pioneer of microscopy in the 16th century. He is incorrectly known as the inventor of optical microscope but the inventors were also from the Netherlands; Hans Janssen (father) & Sacharias Janssen (son) of Middelburg.*

*Antonie van Leeuwenhoek is buried in the old Church (or "Oude Jan" as the locals call) of Delft.*

Dr. Oguzhan Copuroglu  
CMC organizer



*Prof. Bert Geerken, Dean of Faculty CiTG, while giving the welcome speech*

## Cooperation between TU Delft and SCUT

In November of 2012 TU Delft started a joint research centre on Urban Systems & Environment (USE) with South China University of Technology (SCUT) China, which is now one of the five joint research centres in TU Delft. The main objective of this research centre is to organize and implement various types of world-class research, education and valorisation activities in the following areas:

- Smart and sustainable infrastructures, architecture and urbanism
- Recycling of concrete structures and sustainable construction materials and efficient utilization of resources
- Governance and planning of metropolitan deltas and the implementation of eco-cities, low carbon cities, smart cities, knowledge cities and eco-industrial parks.

Starting from 2013, the research centre started to support different levels of research activities including traveling funding to support staff visits and exchanges and developing joint research projects between TU Delft and SCUT. In 2013 six research visits and four joint research projects were granted in TU Delft.

Our section is actively involved in the research centre USE as board member of USE. A project proposed by our section on 'Design and Optimization of Durable and Environment-friendly blended Concrete' in cooperation with a colleague of the 'School of Materials Sciences' (SCUT) was granted as a joint research project, where our PhD-student Gao Peng is currently working on. In the beginning of 2014, our section was invited to join the 'Chinese National Basic Project 973' application. Recently, a small joint research project on 'Application of Autogenous Self-Healing in Civil Engineering Practise' was granted.

In Education, a joint master education program is being developed between our faculty (CiTG) and SCUT. In this program three to five MSc-students from SCUT or other Chinese universities will enrol in this program each year with a specialization on construction materials.

## Award Zhengxian Yang

Zhengxian Yang was awarded "The National Award for Outstanding Self-financed Chinese Students Study Abroad 2013". This award is founded by China Scholarship Council and Started in 2003. It aims at rewarding the academic excellence of self-financed Chinese students studying overseas. Only those with outstanding performance in their PhD studies will be considered by the award selection panel and no more than 500 young talents will be granted the award each year all over the world. The award was formally recognized on May 30 in The Hague, the Embassy of China in The Netherlands during the awards ceremony.

Zhengxian received this award for his highly impressive research on the corrosion of reinforcement and the durability of reinforced concrete with a demonstrated publication record during his PhD study. Starting in October 2010, Zhengxian has been working on his PhD project "A new additive for improved corrosion protection of reinforced concrete by modified hydrotalcites" in section of Materials and Environment at the Faculty of Civil Engineering and Geosciences, Delft University of Technology under the supervision of Prof. dr. R.B. Polder. In this project, a new type of environmentally friendly smart concrete additives based on aminoacids modified hydrotalcites and a newly modified integral corrosion monitoring experimental setup have been developed. The outcomes of the project have attracted the attention from some industrial companies. Kisuma Chemicals BV and the cement company CRH have expressed their interest for potential cooperation and follow-up application.

