



RILEM SPRING CONVENTION and SUSTAINABLE MATERIALS, SYSTEMS AND STRUCTURES CONFERENCE: a REPORT (or WHAT DID YOU MISS?)

Rovinj, Croatia, 18 – 22 March 2019
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The 2019 RILEM Spring Convention kicked off on Monday morning, 18 March. It went through two intense working days, full of TC meetings (13 to be exact) and RILEM standing committee summits (DAC, TAC and Bureau). In between productive meetings, relaxing coffee breaks and lunches allowed the RILEM TC members to meet friends and colleagues from around the world. Some TC were officially closed and others officially started, but you will see more about this in the 2019 annual technical report which is now a focus of attention and which is to be presented at the [73rd RILEM Annual Week](#) in Nanjing (China) in August.

The RILEM dinner in Pula was the occasion to pay our farewell to Madam Pascale Ducornet, who will leave her position of RILEM General Secretary in October 2019 to enjoy her deserved retirement after almost 25 years of duties! With her gentle and quiet personality, characterised by a strong determination, she has been the pillar of RILEM in rocky transitional periods and always a strong reference point.

The Sustainable Materials, Systems and Structures (SMSS) conference started on Tuesday evening, 19 March, with the welcome reception in the town of Rovinj. The relaxed atmosphere (and maybe a few glasses of Croatian wine) induced a few participants to hit the dance floor and warm up before the walk back to the hotel!

Most of the 450 participants from 50 countries attended the conference opening on Wednesday morning, 20 March. After the house-keeping duties and messages from the local organising committee from the University of Zagreb (they organised and managed a flawless event), on the occasion of the Colonnetti Award ceremony, we had the privilege to have on stage Mrs Margherita Colonnetti, daughter of Gustavo Colonnetti. Mrs Colonnetti brought with her some documents written by her father and collected and published by her mum only after her father's death. These are very precious papers. They were never published because considered not in line with the fascist ideas of those times. Gustavo Colonnetti was a professor of mechanics of materials and the first President of RILEM. As [shared](#) by his daughter at the conference, he devoted his time and efforts to study construction materials, not destroying materials. He openly criticised the use of engineering minds to create weapons. Nothing could have been more appropriate in the current terrorism climate we live in these days...

The humble but still powerful presence of Margarita Colonnetti on stage was replaced by Bahman Ghiassi, first, and Claire White, after, for the presentation of their works upon which they have been awarded the 2019 Colonnetti Medal. Two quite different personalities, but both carrying the same energy and determination typical of young and gifted minds. The reader can learn more about the medallists in the interviews published [here](#). These under-35 scientists have clear ideas on how to contribute to our society. Bahman's concerns on the safety of existing masonry buildings brought him to investigate sustainable ways to strengthen these structures, quite vulnerable in case of earthquakes. Claire combines her physics and civil

engineering background with her passion for the environment to study “new” concretes with low CO₂ emissions.

After a relaxing coffee break, the morning continued with the presentation of two prestigious keynote speakers, Prof. Surendra Shah and Prof. Karen Scrivener. Both presentations discussed methods to make concrete a material with less impact on CO₂ emission. On this regard, Prof. Shah proposed the application of nanotechnology to improve the performance of high strength concrete used in “super” structures. One approach consists of limiting the amount of cement content (main responsible of the carbon footprint in concrete) by replacing some part of it with fly ash and nano silica particles. Prof. Scrivener sustained her view on the use of LC3, lime calcined clay concrete, as the next evolution (and not revolution) in concrete applications. I would be tempted to summarise her view with the sentence “keep calm and carry on”, as what we are doing in terms of concrete and CO₂ emission is not so bad as to require major changes. Smart changes (like the use of calcined clay that is obtained at 800 rather than 1450 degrees Celsius) can significantly affect the reduction of CO₂ without re-inventing the production of clinkers and the entire manufacturing processes of concrete. Prof. Scrivener advocated also that “...respecting minimum cement contents without being over conservative is also a remedy which could be implemented very rapidly ...”

The afternoon of Wednesday 20 March saw the presentation in parallel sessions of special RILEM TCs.

On Thursday morning, Prof. Sørensen discussed in the plenary session the issues on the reliability of gravity based off-shore concrete foundation of wind turbines. Nowadays, these silent giants converting renewable wind energy into other forms of energy can almost be as high as the Eiffel Tower and their concrete foundations can reach diameters of almost 200 m. Designing these structures requires the understanding of fatigue and extreme loads analysis using statistical approaches. On the same morning, Dr. André Orcesi shared his studies on life-cycle assessment of bridges to emphasise the need for sustainability, i.e. the need to do material and industrial processes more environmentally friendly.

Twenty-eight PhD students took up the challenge of presenting their work in 120 seconds in the PhD symposium that took place after the plenary lectures on Thursday morning. The topics stretched from cross-laminated timber to straw-based boards (there is more than concrete out there in the construction material industry...), from corrosion detection of reinforced-concrete elements to retrofitting of existing concrete structures (durability and maintenance are key components of a sustainable construction practice), and many more topics. This was really a very great way of getting a good overview from the students’ on ongoing PhD topics!

After the PhD symposium, conference speakers and delegates found their way into 7 parallel sessions. The busy day concluded with a sparkling Gala Dinner, in which the excellence of the organising committee appeared in all its splendour! The always-smiling Prof. Dubravka Bjegović and the never resting Assist. Professors Marijana Serdar and Ivana Banjad Pečur organised, for the entertainment of the delegates, a live-music performance that brought the conference attendants (including RILEM President Prof. Gettu) on the dance floor for a few hours. Rumour has it this was a unique experience never having been seen over the last 2 decades even not at the RILEM Annual Week events.

After all that dancing, still a big and very interested group of delegates (some maybe a bit sleepy) made their way on Friday morning to the last four plenary presentations of the conference. Dr. Laustsen informed the audience on the way the minimum requirements for

energy efficiency, demanded by the European Community, are set by each European country based on an enormous database of existing residential and commercial building performances. Prof. Imamoto discussed the effect of relative humidity and carbonation on the corrosion of steel bars in concrete elements this dating back to the first Japanese requirement with respect to cover thickness back to 1928. Dr. Niederleithinger and Dr. Popovic reminded the audience about the importance of non-destructive methods to assess the well-being of a structure and presented some recently developed new ground radar penetration technologies.

The Editorial Board of [RILEM Technical Letters](#) selected ten articles presented at the conference for publication in open access.

From the conference segment “NEW GENERATION OF CONSTRUCTION MATERIALS”, the invited papers were:

- *Particle size optimization in multi-component cement*, S. Adu-Amankwah, S. A. Bernal and L. Black
- *Effects and potentials of plant based chemical admixtures on the performance of cementitious construction materials*, W. Schmidt, I. L. Tchegnina Ngassam, K. A. Olonade, R. Mbugua and H. Kühne
- *Instantaneous activation energy of alkali activated materials*, S. Joseph, S. Uppalapati and Ö. Cizer
- *Comparing the reactivity of different natural calcined clays under alkali activation*, A. Z. Khalifa, Y. Pontikes, J. Elsen and Ö. Cizer
- *Influence of hydric solicitations on the morphological behavior of hemp concrete*, F. Bennai, C. El Hachem, K. Abahri and R. Belarbi
- *Surface modification as a technique to improve inter-layer bonding strength in 3D printed cementitious materials*, J. Van Der Putten, G. De Schutter and K. Van Tittelboom

From the conference segment “DURABILITY, MAINTENANCE AND REPAIR OF STRUCTURES”, the invited papers were:

- *Testing properties governing the durability of lime-based repair mortars*, I. Papayianni, J. Válek, J. Alvarez, V. Bokan Bosiljkov, P. Faria, L. Ferrara and C. Groot
- *Long-Term Mechanical and Shrinkage Properties of Cementitious Grouts for Structural Repair*, M. Shamsuddoha, G. Hüsken, W. Schmidt, H. Kühne and M. Baeßler
- *Numerical Investigations on post-fire bond performance of reinforcement in concrete*, A. Das, J. Bošnjak and A. Sharma
- *Air permeability, water penetration and water absorption to specify durability of ECO-friendly concrete*, J. Juhart, R. Bregar, G. David and M. Krüger

The conference version of these selected publications are available, together with all other papers presented at the conference, in the six conference proceedings that can be downloaded for free [here](#).

The closing ceremony on Friday afternoon was the occasion to say THANK YOU! again to the local organising committee and congratulate all its members on the excellent job they did. The organising committee of the next [2020 RILEM Spring Convention](#) in Guimarães (Portugal) is well aware they are now facing a very high standard, but at the same time they are very confident and also motivated to come up with a unique solution to involve students even in some voting completion approach! We look forward to seeing you All there!