

# NEWSLETTER

April, 2024



Indian Institute of  
Technology Madras



Technologies for  
Low-Carbon and Lean  
Construction

## In this issue

- Guest Column: In conversation with Dr. Raúl Luis Zerbino
- International Collaboration: Prof. Ravindra Gettu, attended RILEM Spring Convention and Conference (2024), held in Milan, Italy, on 7-12 April 2024
- Upcoming Conference: CONSEC24 will be held on 25-27 September, 2024 at Radisson BLU Hotel GRT Chennai; Early Bird Registration closes on May 31, 2024
- Pre-conference workshop in CONSEC24 on September 24 on (i) Corrosion Control of Concrete Structure (C3S) and (ii) Construction Technologies for Sustainable Concrete Infrastructure
- For more details, please visit [www.consec24.com](http://www.consec24.com)



Dr. Raúl Luis Zerbino with reserach scholar and lab staffs at IIT Madras

## International Collaboration



Prof. Ravindra Gettu with RILEM president Dr. Nicolas Roussel and RILEM Vice president, Dr. Nele De Belie and 2025 RILEM Spring Convention organizers Dr. Liberato Ferrara and Dr. Giovanni Muciaccia



Prof. Ravindra Gettu at RILEM Stall

The RILEM Convention 2024 was held in Milan, Italy, in conjunction with the International Conference on Advanced construction materials and processes for a carbon-neutral society, organized by a close collaborator of CoE TLC2, Prof. Liberato Ferrara. Prof. Ravindra Gettu was there to attend the RILEM Bureau and other committee meetings, as well participate in the conference, where he presented recent results on studies of textile reinforced concrete.

Find us: <https://tlc2.iitm.ac.in/>

BSB 205, Department of Civil Engineering, IIT Madras, Chennai - 600036, India





Meet Dr. Raul Luis Zerbino, Visiting Professor at IIT Madras and our collaborator at CoE on TLC2. Prof. Raul Luis Zerbino spent about two years at IIT Madras. He was an Associate Professor at the National University of La Plata, Argentina, and is a Principal Researcher of the National Council of Scientific and Technical Research (CONICET), Argentina. He has extensive experience in concrete technology, fibre reinforced concrete and other special concretes. Here he talks about his experience at IITM, as he prepares to return to La Plata.

## Your research interests

My research main fields of interest include concrete fracture and mechanical behaviour, technology of fibre-reinforced and self-consolidating concrete, the use of mineral additions and chemical admixtures in cement-based materials and the study of residual properties in damaged concretes.

## Please tell us about your career path to date

In 1978, during my 3rd year of Civil Engineering in La Plata National University (UNLP) one professor invited me to help in his research work on concrete technology in the Laboratory of the Engineering Faculty. From this time, I have never stopped to study and research on concretes and other civil engineering materials. That year, I also started to collaborate in the courses on materials in the faculty. During my last two years in Civil Engineering, I was working on concrete creep and shrinkage, and some special topics, such as roller compacted concrete, lightweight concrete and expansive concrete.

After graduating I got a scholarship in 1981 to study a novel subject at this time - Fibre Reinforced Concrete; the research was developed at the Laboratories of LEMIT-CIC in La Plata city, and I have continued working on this subject all my life.



Dr. Raul Luis Zerbino in MPCEM lab

During that year we participated in a post-graduate course in LEMIT with the presence of relevant specialists, such as Adam M. Neville, Sandor Popovics, Folker H. Wittmann, P. Kumar Mehta and V. Mohan Malhotra. Regarding studies on special concretes, in 1986 I had a stay in CANMET, Ottawa, Canada, to study the use of fly ash in portland cement materials. After a few years we started, in LEMIT and the Engineering Faculty of UNLP, a huge project on High Strength Concrete. This project was articulated with research on concrete microstructure, mainly on the influence of interfaces in concrete behaviour, theme on which I developed my Ph.D. thesis. Imagine that at that time we wrote down and calculated measurements with pencil and paper, FAX, e-mails and first computer writing processors had just appeared, and in Argentina we hardly knew about them.

## How and when did you meet Dr. Ravindra Gettu?

In 1992, I received a letter from Dr. Ravindra Gettu, a letter by post, asking me for a publication from our work on high strength concrete. As I was about to participate in a Congress in Toulouse, France, I proposed to give it to him by hand in Barcelona, where Ravindra was working then at the UPC. That's where we met for the first time, since then we've shared this passion for materials research and over the years we've forged a deep friendship. I have learned a lot with Ravindra, as he invited me to make several stays at the UPC in Barcelona, where I have also sent some of my students.

Dr. Raul Luis Zerbino with TLC2 Professors at MPCEM Lab





There, we have worked a lot on Self-Compacting Concrete, and Fiber Reinforced Concrete, among other topics. In the 21st century, the UPC carried out one of the first experiments on creep in cracked Fiber Reinforced Concrete. My first visit to IIT Madras was for the BEFIB 2008 Conference, where I showed some of these results.

Experience on the same topic continued in Argentina, and several years later the Technical Committee 261-CCF Creep Behavior in Cracked Sections of Fiber Reinforced Concrete was formed, with the participation of laboratories from countries around the world, including IIT Madras.

### Your idea about sustainable concrete and way forward

Concerning special concretes and sustainability, since 2001, we have been developing in LEMIT a line of research on Recycled Concrete and parallel studies on the use and disposal of other residues in cement-based materials, including the use of ash from hospital waste incineration, waste from the leather industry, foundry sand and zeolite materials obtained from spent fluid cracking catalysts, among others. It must be mentioned that I also have been done a lot of research on other civil engineering materials such as, asphalt concretes and woods. Regarding my idea on sustainable concrete and way forward, which of course includes many aspects, in my opinion, the main concepts to take into account are the relevance of developing of durable infrastructure. Although many byproducts and waste materials can be used in concrete, concrete is a cheap material and always the advances in concrete technology were developed from economic benefits, and now we understand and must communicate that in terms of costs, in addition to the material itself; we must not forget environmental effects and maintenance and durability of the constructions.



Dr. Raul with Prof. Gettu and students during the fabrication of Glass Textile Reinforced Concrete Tanks for modular sewage treatment plants

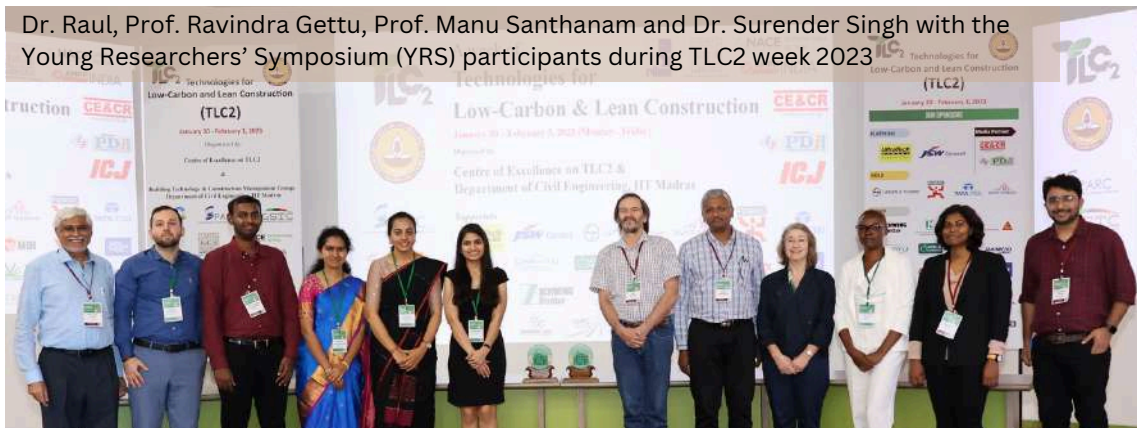
### Life at IIT Madras

Coming back to the collaboration with Prof. Ravindra Gettu and IIT Madras, I had a one month stay in 2018, where I had the opportunity to feel the kindness of all people of IIT Madras, during which I participated in the analysis and discussion of results from studies on Fiber Reinforced and Textile Reinforced Concretes. Then, they invited me to consider a longer stay, this was delayed due to the pandemic, but we could start in June 2022 and the last two years I have been here as a Visiting Professor as a part of the TLC2 project. I can't say enough to express my gratitude for the warmth and attention I have received during this time from the professors, students and staff of IIT Madras; this has been a very beautiful and significative experience that I will carry forever in my heart.



Dr. Raul in the TLC2 week 2023

Dr. Raul, Prof. Ravindra Gettu, Prof. Manu Santhanam and Dr. Surender Singh with the Young Researchers' Symposium (YRS) participants during TLC2 week 2023





## Plenary Speakers



**Prof. Alexandra BERTRON**  
INSA Toulouse, France  
Behaviour of SCM and low-CO<sub>2</sub> binders and systems in sewer networks



**Prof. Jose Ivan ESCALANTE-GARCIA**  
CINVESTAV Saltillo, Mexico  
Novel alkali activated binders using precursors of limestone and recycled pulverized concrete



**Prof. Paolo GARDONI**  
University of Illinois Urbana-Champaign, US  
Sustainability and resilience of large-scale concrete bridge infrastructure systems



**Prof. Ippei MARUYAMA**  
The University of Tokyo, Japan  
Performance evaluation of concrete under specific conditions for nuclear reactor buildings



**Prof. Robert MELCHERS**  
The University of Newcastle, Australia  
Resilience of reinforced concrete structures in corrosive conditions



**Prof. Lisbeth M. OTTOSEN**  
Technical University of Denmark, Denmark  
Reuse of structural concrete components in new buildings



**Prof. Stefano PAMPANIN**  
Sapienza University of Rome, Italy  
Designing precast concrete structures for earthquake resistance - Past, present, and future



**Prof. Giovanni PLIZZARI**  
University of Brescia, Italy  
Structural repair of tunnel segments



**Prof. Manu SANTHANAM**  
Indian Institute of Technology Madras, India  
Sulphate Attack: After 20 years of 'whither'ing



**Prof. David TREJO**  
Oregon State University, USA  
Service life of concrete structures and standardization - challenges and way forward

## Keynote Speakers



**Dr. Asit BAXI**  
Baxi Engineering, Inc. Houston, USA  
Post-tensioned concrete structures for excessive loading conditions



**Prof. Shashank BISHNOI**  
Indian Institute of Technology Delhi, India  
Carbonation of low clinker concretes: when it is a concern and when it is not



**Prof. Pedro CASTRO BORGES**  
Avanzados del IPN Unidad Mérida, Mexico  
Social appropriation of knowledge about concrete durability in vulnerable coastal communities. The role of the participatory action research (PAR)



**Prof. Gino EBELL**  
BAM - Berlin, Germany  
Stress corrosion cracking in prestressed concrete bridge - A case study



**Prof. Yang EN-HUA**  
Nanyang Technological University, Singapore  
Characterization & tailoring of mechanical properties of engineered cementitious composites under dynamic loading condition



**Prof. Liberato FERRARA**  
Politecnico di Milano, Italy  
Material and process design in 3D Concrete Printing via AI driven experiments and modelling



**Prof. Burkan ISGOR**  
Oregon State University, USA  
Innovative approaches to mitigate reinforcement corrosion in concrete



**Dr. Fragkoulis KANAVARIS**  
ARUP, UK  
New perspectives for sustainable and durable concrete materials and structures



**Prof. Laurie LACARRIÈRE**  
INSA Toulouse, France  
Modeling the durability of structures under multiphysical loads



**Prof. Sriramya D. NAIR**  
Cornell University, USA  
Viability of Utilizing Supplementary Cementitious Materials for Subsurface Infrastructure



**Prof. Sreejith NANUKUTTAN**  
Queen's University of Belfast, UK  
Calcium focused design for longevity of concrete structures in silage environment



**Prof. Suriya Prakash S.**  
Indian Institute of Technology Hyderabad, India  
Use of GFRP rebars in construction: Recent research on short and long term performance



**Prof. Enrico SASSONI**  
University of Bologna, Italy  
Phosphate treatments to enhance the durability of cementitious materials



**Dr. Lok Pratap SINGH**  
National Council for Cement & Building Materials, India  
Enhancing the performance and durability of cementitious materials through nanotechnology



**Prof. Marijana SERDAR**  
University of Zagreb, Croatia  
Does carbon footprint reduction impair mechanical properties and service life of concrete?



**Dr. Ali Akbar SOHANGHPURWALA**  
CONCORR, Inc., USA  
Application of service life modeling and selecting appropriate technologies for extending service life of RC structures



**Prof. Pang SZE DAI**  
National Univ. of Singapore, Singapore  
Achieving ease of assembly and robustness in structural systems made with Prefabricated Prefinished Volumetric Construction (PPVC)



**Mr. David TEPKE**  
SKA Consulting Engineers, USA  
At the intersection of structural performance, durability and sustainability of concrete in severe environments for a safe, responsible future



**Prof. Bernardo TUTIKIAN**  
Univ. of Vale do Rio dos Sinos Campus São Leopoldo, Brazil  
Accidents of concrete structures under fire (or elevated temperatures)



**Prof. Anya VOLLPRACHT**  
RWTH Aachen University, Germany  
Carbonation in concretes with SCMs

Early Bird Registration closes on May 31, 2024