

# NEWSLETTER

February, 2024



Indian Institute of  
Technology Madras



Technologies for  
Low-Carbon and Lean  
Construction



IIT Madras faculty members and alumni at the Gordon Research Conference (GRC) on Advanced Materials for Sustainable Infrastructure, Ventura Beach, California, February 2024

## 10<sup>th</sup> International Conference on CONcrete under SEvere Conditions - Environment & Loading (CONSEC24) will take place in IIT Madras, Chennai, India, September 25 - 27, 2024

CONSEC conferences focus on the advancements in the areas related to the design, construction, testing, and preservation of various construction materials and systems exposed to severe environmental and loading conditions. Earlier CONSECs were held in Japan (1995), Norway (1998), Canada (2001), South Korea (2004), France (2007), Mexico (2010), China (2013), Italy (2016), and Brazil (2019). The Centre of Excellence on Technologies for Low-Carbon and Lean Construction (TLC2) at the Indian Institute of Technology Madras feels proud and privileged to organize the 10th CONSEC in Chennai, India (named as CONSEC24). CONSEC24 will provide a single platform for exchanging ideas in both focussed and holistic manner for the design, construction and conservation of reinforced concrete structures experiencing severe conditions. We invite students, researchers, faculty members, and practitioners working in the relevant areas of structural engineering and construction materials to attend CONSEC24 and make it a huge success.

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

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## In this issue

### Upcoming Conference

CONSEC24 at IIT madras, Chennai, India,  
September 2024 ([www.consec24.com](http://www.consec24.com))

**Abstract submission deadline:**  
**March 31, 2024**

### Gordon Research Conference

Gordon Research Conference (GRC) on Advanced Materials for Sustainable Infrastructure Development, co-chaired by Prof. Ravindra Gettu and co-sponsored by IIT Madras took place at Ventura Beach, California from February 25 - March 1.

### Available M.S./Ph.D. positions

We are seeking highly motivated students to pursue M.S. or Ph.D. in TLC2 related topics in the BTCM group at IIT Madras

Apply now at <https://research.iitm.ac.in/>  
For admission queries, write to [tlc2@civil.iitm.ac.in](mailto:tlc2@civil.iitm.ac.in)

International students can apply at  
<https://admissions.ge.iitm.ac.in/>



## THEMES

### Advanced materials for severe conditions

- Cements and binders (SCMs)
- Chemical admixtures
- Hydration and microstructure
- Metallic and non-metallic reinforcement (fibres, mesh, bars, strands)
- Alternative aggregates

### Lab/field testing and characterisation

- Material characterisation tests
- Accelerated tests and long-term performance
- Non-destructive testing
- Forensics and condition assessment
- Naturally deteriorated systems

### Repair and strengthening materials and methods

- Preventive maintenance
- Electrochemical repair
- Waterproofing & coating
- Grouts and grouting methods
- Repair mortar and concrete
- Residual capacity assessment
- Strengthening techniques

### Damage, deterioration and transport properties

- ASR, sulphate or acid attack
- Chloride ingress
- Carbonation and leaching
- Corrosion of reinforcement
- Creep and shrinkage
- Fatigue and fracture

### Service life, reliability, sustainability and resilience

- Simulation of residual capacity
- Service life and durability
- Reliability and resilience
- Sustainability and life cycle assessment (LCA)
- Standardization and codes

### Special concretes and construction techniques

- FRC, TRC, HPC, UHPC, SHC
- Precast concrete
- 3D-concrete printing
- Underwater construction
- Cold-weather construction
- High-rise concrete pumping

## PLENARY SPEAKERS



**Prof. Alexandra BERTRON**

INSA Toulouse, France

Topic: The behaviour of SCM and low-CO2 binders and systems in sewer networks



**Prof. Jose Ivan ESCALANTE-GARCIA**

CINVESTAV Saltillo, Mexico

Topic: Novel alkali activated binders based on precursors of limestone and recycled pulverized concrete



**Prof. Paolo GARDONI**

University of Illinois Urbana-Champaign, US

Topic: Sustainability and resilience of large-scale concrete bridge infrastructure systems



**Prof. Ippei MARUYAMA**

The University of Tokyo, Japan

Topic: Performance evaluation of concrete under specific conditions for nuclear reactor buildings



**Prof. Robert MELCHERS**

The University of Newcastle, Australia

Topic: Resilience of reinforced concrete structures in corrosive conditions



**Prof. Stefano PAMPANIN**

Sapienza University of Rome, Italy

Topic: Designing precast concrete structures for earthquake resistance - Past, present, and future



**Prof. Giovanni PLIZZARI**

University of Brescia, Italy

Topic: Structural repair of tunnel segments



**Prof. Manu SANTHANAM**

IIT Madras, India

Topic: The way forward on performance specifications for achieving durable concrete structures



**Prof. David TREJO**

Oregon State University, US

Topic: Estimation of service life of concrete structures - challenges and way forward

# GORDON RESEARCH CONFERENCE 2024 at Ventura Beach, California, US

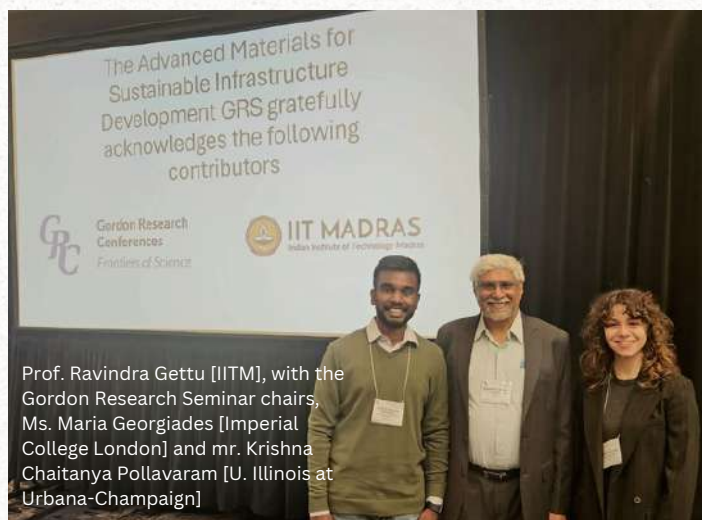
Gordon Research Conference (GRC) on Advanced Materials for Sustainable Infrastructure Development - Accelerating Sustainable Concrete Construction, co-sponsored by IIT Madras, took place at Ventura Beach, California from February 25 - March 1, 2024. Prof. Ravindra Gettu co-chaired the conference with Prof. Jason Weiss. The prime focus of this GRC was exploring technologies for reducing carbon emissions in construction sector with allied topics on binder innovation, mixture proportioning, structural engineering, (de)construction innovation, end-of-life resource management and automation in construction.

Prof. Koshy Varghese was invited as discussion leader for session on "Artificial Intelligence and Data Science". Prof. Manu Santhanam delivered a talk on "Challenges in Durability Design of Special Concrete: An Indian Perspective". Prof. R.G.Pillai shared his ongoing research on "Extending service life of concrete structures using galvanic cathodic protection - challenges and research by needs" in poster session. Dr. Keerthana Kirupakaran participated in poster session showing her recent work on "Investigating fatigue behaviour of TRC".

Dr. Yuvaraj Dhandapani, an alumnus of BTCM division at IIT Madras made a presentation titled "Challenges in Characterizing Carbonation in Hardened and End-of-Life Concrete: Implications on Performance". Gordon Research Seminar (GRS) on Exploring Emerging Technologies for Reducing Carbon Emissions was held in conjunction with GRC on February 24 - 25, 2024 chaired by Ms. Maria Georgiades from Imperial College London and Mr. Krishna Chaitanya Pollavaram, an IITM alumnus, currently pursuing Ph.D. in U. Illinois at Urbana-Champaign.

Gordon Research Conference (GRC) provides a supportive and collaborative environment for young doctoral and post doctoral researchers to share their work and to interact with the fellow students and experts in the field.

From Left to Right: Profs. Ravindra Gettu, Manu Santhanam, Keerthana Kirupakaran, Koshy Varghese and R. G. Pillai



## Available M.S./Ph.D. Positions in CoE on TLC2

»» We are seeking highly motivated students to pursue M.S. & Ph.D. in the following topics:

- Extending the service life of corroding concrete structures by 50 years by using galvanic cathodic protection**
  - Dr. Radhakrishna G Pillai, pillai@civil.iitm.ac.in , <https://civil.iitm.ac.in/faculty/pillai/>
- Durability Studies on Laboratory-Synthesized Calcium Sulfoaluminate Belite Cement**
  - Dr. Piyush Chaunsali; pchaunsal@civil.iitm.ac.in ; <https://civil.iitm.ac.in/faculty/pchaunsali/>
- Developing Virtual Reality based Construction Safety Training Programs for India**
  - Dr. Nikhil Bugalia. nbugalia@civil.iitm.ac.in (<https://civil.iitm.ac.in/faculty/nbugalia/>)
- Opportunistic Behaviour and Construction Disputes: Measurement and Mitigation** and
- A Framework for Implementing Lean and Sustainable Construction Practices in Projects**
  - Dr. Murali Jagannathan, muralij@civil.iitm.ac.in, <https://civil.iitm.ac.in/faculty/muralij/>
- Institutional Change for Sustainability in Construction** and
- Coordination and benchmarking for Sustainability in Construction**
  - Dr. Ashwin Mahalingam. Mash@civil.iitm.ac.in, <https://civil.iitm.ac.in/faculty/mash/>
- Nucleation and growth of cement hydrates using molecular dynamics and density functional theory calculations**
  - Dr. Aslam Kunhi Mohamed, akm@iitm.ac.in, akm@civil.iitm.ac.in, <https://civil.iitm.ac.in/faculty/aslam/>
- Mechanical, Fracture and Fatigue behaviour of sustainable construction materials: (a)Textile reinforced concrete (TRC) and (b) Fibre reinforced concrete (FRC)**
  - Dr. Keerthana Kirupakaran, keerthanak@civil.iitm.ac.in <https://civil.iitm.ac.in/faculty/keerthanak/>



Apply soon

Last Date of Receipt of  
Online Application:  
March 31, 2024