

Interview with Dr Zhenming Li, 2024 RILEM Colonnetti medallist

Dr Zhenming Li is a Professor at Harbin Institute of Technology (Shenzhen), China. He has served as executive secretary for the RILEM Technical Committee [294-MPA “Mechanical properties of alkali-activated concrete”](#). He is also a TC member of [283-CAM : Chloride transport in alkali-activated materials](#), [289-DCM : Long-term durability of structural concretes in marine exposure conditions](#), and [UMW : Upcycling Powder Mineral “Wastes” into Cement Matrices](#). Dr Li received the 2024 RILEM Colonnetti medal for his achievements in understanding, predicting and mitigating the autogenous shrinkage of



alkali-activated materials. Dr Li will be a key-note speaker at the [2024 RILEM Spring Convention](#), in Milan, Italy, presenting “Autogenous shrinkage of alkali-activated materials”.

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Daniela Ciancio, RILEM Implementation Manager (RIM): Good... what’s the time now in Harbin?

Prof. Zhenming Li (Zhenming): Good evening! It’s 8 pm, but I am not in Harbin. I am based in Shenzhen, in the south of China, in another campus of the Harbin Institute of Technology.

RIM: I see! Good evening, then, Zhenming! How is the relocation going?

Zhenming: Good! It's really nice to be here. I have a bigger office, a big desk. They offered me a good place to work!

RIM: You're settling in, basically, after so many years in Europe! You're 33, if I'm not wrong; you left China soon after the end of your master’s degree. You are back now after an 8-year skyrocketing career, in terms of your track records and the impact of your research. How do you feel about this?

Zhenming: You are right. Actually, at a first glance, the feeling is nice. The list of publications makes me feel confident that I can do high-quality research; but, at the same time, it kind of implies new requirements, like “you already achieved something...how about in the future?”. I cannot say I can relax from now on, because in China, the atmosphere is more competitive or just faster than Europe. There will be always some new goals that require more efforts to reach.

RIM: Do you expect to have many PhD students helping in your research? Will you create your own team?

Zhenming: Yes, I hope so! Maybe not many PhDs, but there will surely be several master's students. Not immediately, but from late this year I will have some. Some students started to contact me as they saw the news of the RILEM medallist. As bachelor or master's students, they don't quite know RILEM yet, but they said that it sounds terrific!

RIM: Good! New RILEM people from China!

Zhenming: Yes, potential members! I have to say that the RILEM Colonnetti medal really helped me to improve my visibility amongst younger students, who started to know me from this matter.

RIM: I understand that you joined RILEM when you moved to Europe, basically during your PhD studies. Your career inside RILEM has been very active. You have collaborated with very renowned people, been active in many RILEM Technical Committees. Was this the first time that you applied for this medal?

Zhenming: I also tried last year. I prepared what I thought was a good application profile, but I didn't get the medal. I felt a bit disappointed to be honest. But when the 2023 medallists were announced, I saw that [Dr Guoqing Geng got it](#), then I felt better (laughs). I actually know him, and I admire him. He's senior than me and he already started to organise his own group in [NUS](#). I said "OK, of course he deserves it more than me. Maybe I have another try next year".

RIM: This is very nice of you to say! Let's talk about your research now: autogenous shrinkage. Shrinkage is not 100% well understood for "standard" concrete... and you are taking this research to another level with alkali activated materials! Your achievements are not only theoretical, in terms of publications and citations, but also practical! Can you say something more about this?

Zhenming: Yes, sure! It all started when I first contacted Prof. [Guang Ye](#). After my master's degree, I wanted to study abroad; I found a name which could be a Chinese name. I said "OK, as my English is not very fluent, maybe this person can speak Chinese with me if needed". So I contacted him, he said "OK but you need to write a research proposal on a very challenging topic which is the shrinkage of geopolymers". At that time, I didn't know the difference between concrete and geopolymer. I accepted the topic. As you said, even for "standard" concrete this is an unsolved issue or a hot topic; for example, a lot of professors like [Prof. Pietro Lura](#), whom I personally know, are still studying this property. At that time, my first idea was to use the theories and mechanisms for "standard" concrete, but then I found out that it didn't really work. I'm not really a very smart guy. Prof. Ye gave me a lot of freedom so I could explore by myself, but I was kind of lost in the beginning. You can see from my [publications list](#) a very interesting thing: in my master's period and in the first three years of my PhD period, I got no research output.

RIM: But this is quite normal! You are not expected to start publishing straight away!

Zhenming: Indeed! But it took me a little longer than most people to start publishing and to finish a PhD. You know, my bachelor background is in civil or structural engineering. I didn't know cement chemistry in the beginning. So, I think maybe it was fair for me to take some time to get to the core of the problem.

RIM: Is it "curing" the solution to all shrinkage problems?

Zhenming: No! curing doesn't solve the problem. It avoids us to encounter the problem. Internal curing for instance gives the material enough humidity, but actually it doesn't really change the shrinkage mechanism or the material from the fundamental or chemical level. If you want to solve the problem, you have to start from the "gel level": the C-A-S-H gel is vulnerable to deformation, because there are a lot of sodium and alumina there.

RIM: Are you going to talk about this during [your lecture in Milan](#)?

Zhenming: I think so. I will first of course summarise my findings till now and I will also try to propose some potential solutions, but I don't have mature ideas either.

RIM: I read that some of the lecturers of the courses that you attended as a PhD student, became co-authors of your publications.

Zhenming: Yes! It has been a fantastic experience for me! I attended a RILEM course in 2016 in Denmark (*editor's note: [Service Life of Cement-based Materials and Structures](#), 15-19 August 2016, Lyngby, Denmark*). I remember the lecturers were Prof. Ole Jensen, Prof. Stéphanie Staquet, Prof. Kostantin Kovler, and Dr Miguel Azenha. We didn't start as co-authors but friends. I asked Prof. Jensen lots of questions since he is one of the first studying shrinkage problems. I am in collaboration with Stéphanie and Miguel. Actually, Miguel just sent me some congrats and jokes for this medal. As a participant of that course, I received a free RILEM membership. That course was special because all the teachers brought their own facility from their countries to Denmark, so that we could see the real instruments like the ring test, the EMM-ARM instrument, the adiabatic calorimeter, etc.

RIM: What is the impact of your research to the society?

Zhenming: Alkali materials are sustainable alternatives. Many researchers did calculation on this aspect: the production of pure alkalis indeed can cause some CO₂, but the total CO₂ emission is still lower than other materials; we can even use waste alkalis. My PhD project was a pure research project, but there were some committee members from industry; my postdoc project called "*Wool2Loop*" had actually more industrial partners than universities. There is definitely a great interest in this topic from the industry.

RIM: I look forward to attending the award ceremony in Milan and listening to your presentation. Thank you, Zhenming!

Zhenming: Thanks!