



Dr. Hong Hao

CIRCLE
Distinguished Lecture Series

Towards Next Generation Design of Sustainable, Durable, Multi-hazard Resistant, Resilient, and Smart (SDuMuRS) Civil Engineering Structures

ABSTRACT: The design philosophy and methodology of civil engineering structures have been constantly evolving, from the early strength-based to more recent performance-based design and the current intensively researched emerging resilience-based design. Because failure of civil engineering structures often leads to catastrophic consequences, the primary focus of all these design methods is the safety of structures while considering other aspects such as performance and resilience. With the economic growth, population increase and urbanization, as well as global warming and the depletion of natural resources, to meet the societal need for sustainable development, the construction of civil engineering structures also needs to consider sustainability, durability and smart lifecycle management besides safety, performance and resilience. This talk discusses the necessity, challenge and opportunity for the development of the next generation design of sustainable, durable, multi-hazard resistant, resilient and smart civil engineering structures, i.e., 'SDuMuRS'. Critical reviews and discussions on each of these aspects are presented. Research directions are suggested accordingly for achieving these goals for the design of next generation civil engineering structures.

Bio: Hong Hao is a professor in Earthquake Engineering Research and Test Center in Guangzhou University, China and a John Curtin Distinguished professor in Curtin University, Australia and an Australian Laureate Fellow. His research interests are structural dynamics and its applications to structure protections against earthquake, blast and impact loads, as well as structural condition monitoring. Prof. Hong Hao is one of the most highly cited researchers in civil and structural engineering. His research results have been included in textbooks, design codes and have been applied to many construction projects around the world. He has been named multiple times as the annual Australian research field leader in civil and structural engineering, and ranked at the 12th in Civil Engineering in "World's Top 2% Scientists" published by Stanford University in 2022. Prof. Hong Hao received BS degree from Tianjin University in China, and MSc and PhD degree from the University of California at Berkeley, USA. He was the president of Australian Earthquake Engineering Society from 2010 to 2013, and currently is the president of International Association of Protective Structures. He is a distinguished fellow of International Association of Protective Structures, fellow of Australian Academy of Technology and Engineering, fellow of Institution of Engineers Australia, American Society of Civil Engineers and International Association of Engineering Asset Management. Prof. Hao has received over 50 research awards, including Nishino Medal in 2022, Charles Bubb Medal in 2019 and John de Laeter research leadership award in 2018.

CIRCLE: The Center for Infrastructure Resilience in Cities as Livable Environments is one of three research themes supported by the joint Dynamic Research Enterprise for Multidisciplinary Engineering Sciences (DREMES), established between the University of Illinois at Urbana-Champaign (UIUC) and Zhejiang University (ZJU). The CIRCLE Distinguished Lecture Series is intended to provide opportunities for faculty and students to meet and interact with internationally renowned experts in the field.

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Dr. Hong Hao

CIRCLE
杰出讲座系列

面向下一代的土木工程结构设计： 可持续、耐用、多灾害防御、韧性且智能 (SDuMuRS)

摘要：土木工程结构的设计理念和方法一直在不断演变，从早期的基于强度的设计到近年来的基于性能的设计，以及当前正在积极研究的基于韧性的设计。由于土木工程结构的失效往往会导致灾难性后果，所有这些设计方法的首要关注点是结构安全，同时考虑其他方面，如性能和韧性。随着经济增长、人口增加、城市化水平提升以及全球变暖和自然资源枯竭，为满足社会对可持续发展的需求，除了安全、性能和韧性以外，土木工程结构的建设还需要考虑可持续性、耐用性和全生命周期智能管理。本次讲座将讨论发展下一代可持续、耐用、多灾害防御、韧性且智能的土木工程结构（即“SDuMuRS”）的必要性、挑战和机遇。针对上述问题的每个方面，本次讲座都将进行详细的综述和讨论。相应地，为实现上述目标，本次讲座还将提出下一代土木工程结构设计的研究方向。

简介：郝洪教授是广州大学工程抗震研究中心教授、澳大利亚科廷大学约翰·科廷杰出教授，以及澳大利亚桂冠教授 (Australian Laureate Fellow)。他的研究方向包括结构动力学及其在结构抗震、抗爆炸和抗冲击等方面的应用，以及结构健康监测。郝洪教授是土木和结构工程领域被引用最多的研究者之一。他的研究成果已被纳入教材、设计规范，并已应用于世界各地的许多建设项目。他多次被评为澳大利亚土木和结构工程领域年度领军人物，并在2022年由斯坦福大学发布的“世界顶级2%科学家”榜单中位列土木工程领域第12位。郝洪教授于天津大学获得学士学位，于美国加州大学伯克利分校获得硕士和博士学位。他于2010-2013年任澳大利亚地震工程学会主席，现任国际防护结构学会主席。他是国际防护结构学会杰出会士、澳大利亚技术与工程院院士、澳大利亚工程师学会会士、美国土木工程师学会会士和国际工程资产管理协会会士。郝教授先后获得了50多个研究奖项，包括2022年的Nishino 奖章、2019年Charles Bubb奖章和2018年John de Laeter 研究领导奖。

CIRCLE：宜居城市基础设施韧性中心是伊利诺伊大学厄巴纳-香槟分校 (UIUC) 格兰杰工程学院和浙江大学 (ZJU) 建立的三个联合研究中心之一。CIRCLE 杰出讲座系列旨在为教师和学生提供与该领域国际知名专家会面和互动的机会。

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2023年4月26日



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