深地科学论坛（第二十一讲）：深地科学前沿热点问题探究

时间：2021 年 12 月 1 日 15：00-16：00

地点：腾讯会议直播

报告人	报告人单位	报告题目
Veerle Vandeginste	比利时鲁汶大学	**Advanced materials for smart buildings** 腾讯会议（ID：718 317 6634）

欢迎全校教师及同学参加！

深部岩土力学与地下工程国家重点实验室

深部地下工程学科创新基地

《深地科学（英文）》

江苏岩土力学与工程学会

力学与土木工程学院

2021.11.18

报告人简介：

Veerle Vandeginste graduated as a geologist in 2001 and obtained her PhD degree in Geology in 2006 at **KU Leuven**. Then, she conducted research at the **Geological Survey of Belgium**, and subsequently, at CEREGE (Aix-en-Provence, France). She joined the Department of Earth Science and Engineering at **Imperial College London** in 2009, and in 2012, she started there her own Diagenesis research group as an independent research fellow. In 2015, she was appointed as an assistant professor at the **University of Nottingham**, where she established the Geochemistry research discipline in the School of Chemistry, and was promoted to associate professor in 2020. Since October 2020, she is an associate professor in **Materials Engineering at KU Leuven,** where she contributes **teaching in chemistry and material science, engineering and technology, and research on physical chemistry and behaviour of material interfaces**. She received several institutional and international awards, e.g. Arthur Holmes Centenary Research Award, QCCRSC Best poster prize, the Stephen E. Laubach Research in Structural Diagenesis Award, the GDL Foundation Research Fellowship. She is a Fellow of the Geological Society of London, and Fellow of the Higher Education Academy. The motivation behind her research arises from major challenges the world is currently facing, in particular global warming, pollution and finite resources. Hence, her research aims to bring solutions by driving innovation in applications of carbon capture, utilization and storage, renewable energy and energy storage, ecological products and processes, renewable resources, and circular economy. The common focus in her current and previous research is physical chemistry of material interfaces linked with material behaviour. She has spoken at many international conferences, and published her research in the top scientific journals (e.g. Nature Communication, Science Advances). (https://www.vandeginstelab.be/)

报告摘要：

Advanced materials for smart buildings

Global warming and occurrences of climate extremes have already started to take human lives, in particular by heat-related illnesses. The construction industry plays a major role in greenhouse gas emissions, with the cement industry generating about 7% of global CO2 emissions, and buildings consuming about 40% of the world's energy. Significant efforts are thus required to use renewable resources more efficiently and to develop buildings with sustainable, recycled or advanced materials. In the last decades, the advances in nanotechnology have paved the way for the development of nanomaterials with new or enhanced properties, which can contribute to improvements in the energy and environmental efficiency in buildings. Developments have been achieved for a range of building materials, such as concrete with the use of nanocomposites and nanocoatings. Advanced materials to improve insulation and thermoregulation in buildings include silica aerogel, phase-change materials, thermal reflective surfaces, self-cleaning glazing and several types of dynamic glazing. Moreover, efforts are also focused on renewable energy for buildings through, for example, the development of advanced photovoltaic glazing. To bring these innovative advanced building materials more into the market, several challenges still need to be overcome, such as the cost, information and knowledge transfer, and nanoparticle-related health concerns.