The faculty of Engineering of the Vrije Universiteit Brussel and the faculty of Engineering and Architecture of the Universiteit Gent invite you to attend the public defense leading to the degree of

DOCTOR OF ENGINEERING SCIENCES (VUB)
DOCTOR OF CIVIL ENGINEERING (UGENT)

of **Eleni Korda**

The public defense will take place on **Tuesday 16th September 2025 at 5 pm** in room **D.2.01** (Building D, VUB Main Campus)

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ACTIVE CONTROL OF CONCRETE CURING BY ACOUSTIC EMISSION

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Abstract of the PhD research

Acoustic monitoring has recently significantly contributed to the understanding of processes in fresh cementitious media. The ambition of this thesis is, for the first time, to use the real time acoustic emission (AE) behavior to control the curing of the material, aiming at better mechanical properties and at the same time use the recorded data to make projections towards the final quality of the hardened medium. Processes like hydration and shrinkage cracking, which are crucial for mechanical properties gain, also produce high amounts of detectable AE during the fresh state. Therefore, acoustic techniques due to their non-invasive and sensitive nature in combination with optical techniques for displacement measurements form an excellent platform to study the material but most importantly to steer the curing during the very delicate phase of hydration taking advantage of the real time information. This obtains even higher importance when considering modern admixtures like super absorbent polymers and the effort to control their behavior, an aspect that is also treated herein in order to improve the material performance.
Optimizing the mechanical properties of a given mix ensures long standing materials, contributing to sustainability of the built environment which is the driving force behind the research.