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SELF-BURROWING AND BIO-INSPIRED TECHNOLOGIES FOR SITE CHARACTERIZATION

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ABSTRACT

This mini-symposium will bring together researchers and practitioners to foster discussions on advances towards self-burrowing and bio-inspired site characterization. Work in the last ten years has led to understanding of some of the fundamental mechanisms, capabilities, and limitations of biological adaptations used by organisms such as bivalves, earthworms, ants, moles, and tree roots to burrow in different geomaterials. Currently, these advances are being used to develop prototypes for tools with enhanced capabilities. The objectives of this session are to: (i) share the latest research in self-burrowing and bio-inspired technologies, (ii) foster exchange of ideas to identify new areas of research, and (iii) identify areas of site exploration practice where bio-inspired solutions could generate transformative solutions. This session is relevant for the ISC7 because it will address innovative research that can lead to cutting-edge geotechnical technologies that will tackle important challenges such as autonomous site characterization, improved characterization of lateral variability, site characterization in sites with limited access, in-situ testing with lightweight equipment, characterization of extraterrestrial bodies, and increased efficiency and sustainability of site characterization activities. Anticipated contributions can be on experimental, numerical, and analytical investigations on the translation of biological strategies to site characterization technologies, development of new sensors, evaluation of the performance and data interpretation of bio-inspired probes and other characterization methods, fundamental aspects of organism-geomaterial interactions and translation of biological strategies to site characterization technologies.