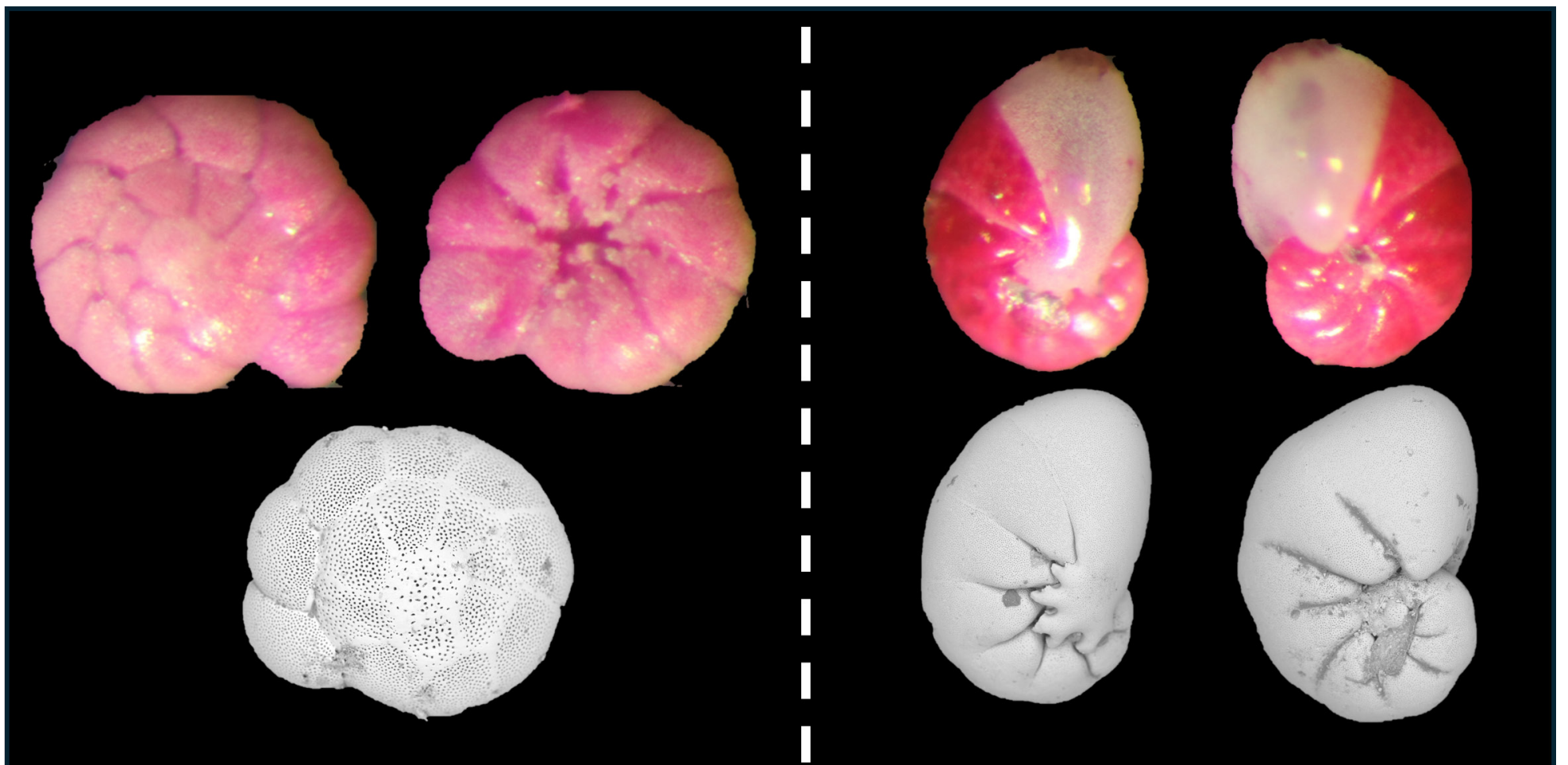




FORALIEN project: Developing novel methods to identify alien species of benthic foraminifera to assess their impact on native biodiversity of the Swedish west coast

Jean-Charles Pavard, Marie-Curie postdoctoral fellow from University of Gothenburg, Sweden

Time & place: March 20, 2025 at 15h00. William-Olsson lecture hall, Geohuset

The FORALIEN project (Marie Skłodowska-Curie Actions) addresses the knowledge gap on non-indigenous species (NIS) of benthic foraminifera in Swedish coastal waters to enhance environmental assessment tools. Foraminifera, single-celled eukaryotes with fossilizable hard shells, are reliable indicators of various pollutants, though, quantitative data on species and their environmental drivers remain limited. Recent metabarcoding analyses reveal that foraminifera contain more genetic species than identified morphospecies, showing diverse environmental needs and the potential to hide NIS. Hence, an efficient taxonomy is needed to detect NIS early and manage large biomonitoring datasets. As NIS can threaten native diversity and ecosystem functioning, their identification is crucial, but the impact of hidden NIS is poorly defined and data on invasive non-pathogenic microorganisms remain scarce, despite their prevalence in ballast water and sediments. For instance, few foraminiferal NIS have been reported in Europe, leaving their distribution, ecological needs, and impact on native biodiversity largely unknown. Foraminifera also offers a unique chance to date NIS arrival time using fossils in sediment records, although few studies to date have used sediment cores for this purpose. Swedish harbors are under-researched concerning foraminifera distribution, despite having well-known issues such as of pollution and habitat destruction. FORALIEN will obtain modern and fossil data from Swedish west coast harbors and aims to (1) develop novel methods such as digital PCR and machine learning for faster identification of foraminiferal NIS; (2) analyze NIS spatio-temporal distribution to create a NIS impact index; and (3) identify NIS ecological requirements for better integration into monitoring surveys. These findings will enhance our understanding of foraminiferal NIS ecology and provide standardized methods to detect their arrival, define their impact and forecast future invasions.

20 | IGV
MAR | Seminar
Series

Department of Geological Sciences
Contact information: allison.hsiang@geo.su.se



**Stockholm
University**