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Department of Marine Sciences  
Presents a Seminar by

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## **The Many Forms of Plastic Pollution: Lessons Learned from *X-Press Pearl* Nurdle Spill**

Plastic pollution is a growing concern for humanity and the planet, and more work needs to be done to understand the fate, persistence, and toxicity of plastic in the ocean and its impact on human health. In May 2021, the M/V *X-Press Pearl* container ship caught fire and spilled more than 70 billion preproduction plastic pellets (also called nurdles) off the coast of Sri Lanka making it the largest plastic spill to date. Complicating the crisis, the ship fire created an unprecedented complex mixture of visibly burnt plastic and unburnt nurdles that littered the west coast of Sri Lanka. Using a set of complementary techniques including densitometry, microscopy, elemental analysis, and comprehensive gas chromatography (GC×GC), our interdisciplinary and international team rapidly provided much needed clarity on the nature of the plastic immediately washing onshore.

Despite the tragedy of the spill, it offers a real-world opportunity to resolve some of the uncertainty surrounding plastic in the ocean, especially pyroplastic, which has yet to be appreciably explored. Subsequent analyses of the *X-Press Pearl* nurdles interrogated the transformations and fate of the plastic and its additives after being subjected to heat and fire. Notably, fire and elevated temperature created several divergent features on the surface of the nurdles without altering their bulk physical properties, presenting a new class of burnt plastic distinct from that weathered by photochemical processes. To address the toxicity of the plastic, leachates are being assayed in a zebrafish bioassay. The results of these diverse assessments reinforce the idea that these spilled pellets are different than those from other spills and sources and offers insight into the bioavailability of the associated toxicants. Only by understanding the fate, persistence, and toxicity of plastic in the environment, can we design more eco-compatible plastics.

**Host:** Molly James

**Time & Date:** 11:00 am, Friday, April 8, 2022

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