CONJUGATED POLYMER NANOPARTICLES AS A UNIVERSAL HIGH-AFFINITY PROBE FOR THE SELECTIVE DETECTION OF MICROPLASTICS IN THE ENVIRONMENT. **Mark Potter**, Angela Awada, Dananjana Wijerathne, James W. Gauld, Bulent Mutus, and Simon Rondeau-Gagné. Department of Chemistry & Biochemistry, University of Windsor, 401 Sunset Avenue, Windsor, ON N9B 3P4, Canada.

Microplastic (MP) contamination has become one of the major environmental concerns of the 21st century. MPs are formed by the natural degradation of plastic-waste, and with less than 9% of the ~6.3 billion tons of cumulative plastic waste being recycled; the number of environmental MPs is steadily increasing. Current MP-identification and detection methods can be time-consuming due their heavy reliance on laborious, complex extraction, and concentration steps. As a result, very little is known about MPs with respects to their environmental or biological impact. In this presentation, we will discuss a novel design for the selective detection of MPs by exploiting fluorescent conjugated polymer nanoparticles (CPNs). The affinity of the CPNs and their components to various MPs were explored via fluorescent microscopy, and computational studies. A very strong affinity to a broad range of MPs was observed with apparent dissociation constant ($K_{D,App}$) values in the picomolar range. These CPNs were shown to be selective to MPs even in the presences of soil debris and other organic contamination. In addition, we will discuss the ability to use these CPNs with a variety of environmental samples, enabling the fluorescence-based detection of MP contaminants irrespective of their origins, collection techniques, or structural characteristics.