NSF Convergence Accelerator

NSF Convergence Accelerator's 2022 Cohort Phase 2 Award

Project Title
PFACTS

Awardee
IBM Corporation through its Almaden Research Center

Award/Contract
49100423C0007

Award Contract Type
R&D

Award Date
December 15, 2022

Principal Investigator
Daniel P. Sanders
dsand@us.ibm.com

Co-Principal Investigators
Jed Pitera

NSF Funded Program
NSF Convergence Accelerator

NSF Program Director
Linda K. Molnar
Track I: Sustainable Materials for Global Challenges
Convergence Accelerator
Directorate of Technology, Innovation and Partnerships
lmolnar@nsf.gov

PROJECT ABSTRACT

PFACTS is a resource for anyone seeking to replace, redesign, or remediate so-called "forever chemicals". These per- and poly-fluorinated alkyl substances (PFAS) are used in everything from non-stick coatings to compostable food containers to semiconductor manufacturing. Given the recent halt of production of some of these chemicals in the US, and the risk of regulation, there is an urgent need to find alternatives. This is especially true in the semiconductor industry which is necessary for maintaining US global competitiveness and national security. However, no central clearinghouse for data, tools, and community knowledge of PFAS has been created - until now. The PFACTS team brings together academic researchers, industry partners, and nonprofit organizations to build a simple, easy-to-use application to recognize PFAS in supply chains, explore or develop alternatives, and identify capture technologies.

PFACTS will be a multi-layered web-based application. The first layer, called "pfasID", will identify PFAS materials by their common name or chemical structure based on a variety of regulatory definitions. Progressing further, the system will provide a knowledge base of known PFAS, their properties and applications, and potential associated alternatives. Leveraging this knowledge base, PFACTS' predictive artificial intelligence models and framework will allow users to assess potential alternatives or novel replacements in a holistic manner, considering not just the initial PFAS material itself but also its environmental decomposition products, pathways, and toxicology, to help prevent any "regrettable substitutions". Finally, there will be a number of essential applications in manufacturing where PFAS use will likely continue for some time. To help users manage their use of PFAS responsibly, PFACTS will provide a recommendation system for capture technologies to stop PFAS from being released into our environment to meet any potential regulations.