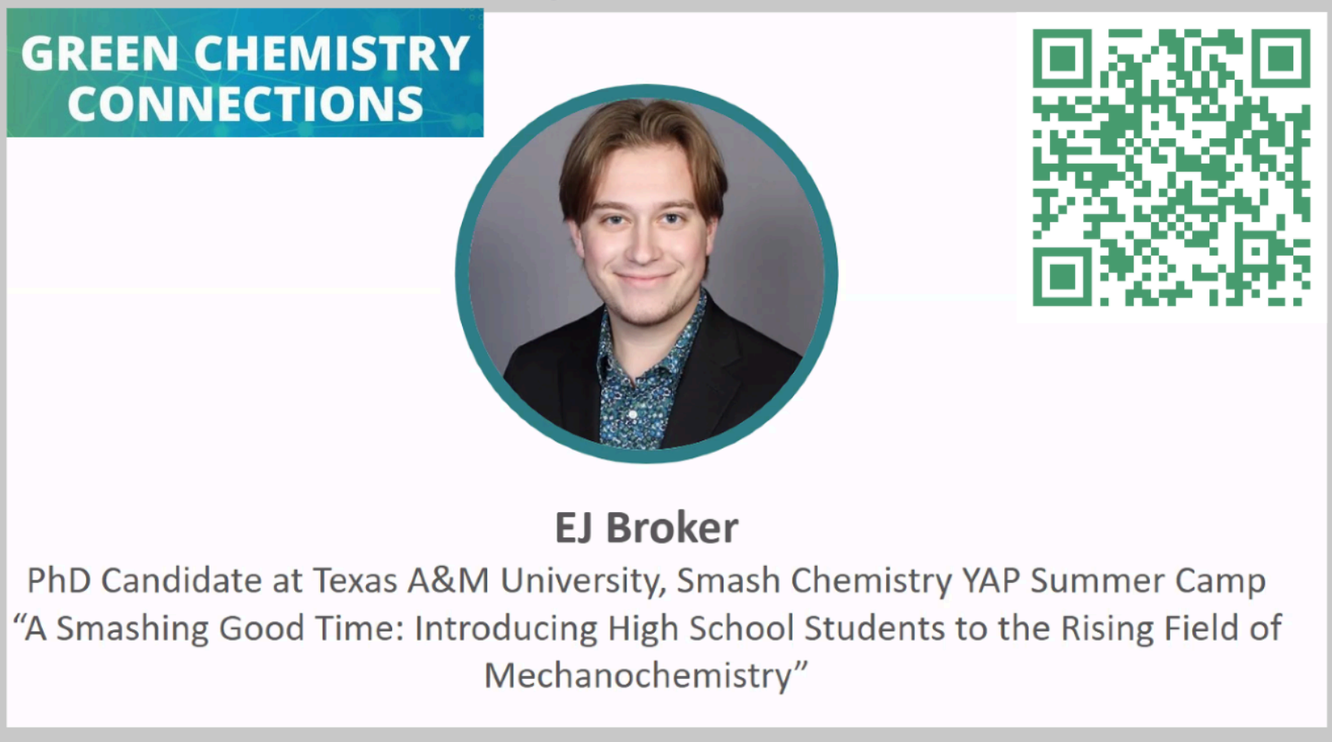
NSF Center for the Mechanical Control of Chemistry

March 2025

Dr. Mark Boyer Presents on Physics-Based Models at Sanibel Symposium

Dr. Mark Boyer, a postdoctoral researcher in the Tabor group at Texas A&M University, recently presented at the 64th Sanibel Symposium on Theoretical Chemistry. He discussed advances in developing simple physics-based models to understand how mechanical force influences chemical reactions. In collaboration with the Marianski group, at Hunter College, the Tabor group has utilized this approach to find optimal forces to apply to accelerate Diels-Alder reactions.

EJ Broker Featured on *Green Chemistry Connections Webinar*



EJ Broker

PhD Candidate at Texas A&M University, Smash Chemistry YAP Summer Camp

"A Smashing Good Time: Introducing High School Students to the Rising Field of Mechanochemistry"

EJ Broker, a PhD candidate in the Batteas Group at Texas A&M University, recently joined Beyond Benign's Green Chemistry Connections Webinar to share insights on the Youth Adventure Program (YAP) summer camp, SMASH Chemistry. In his talk, "A Smashing Good Time: Introducing High School Students to Mechanochemistry," he discussed how students engage in scientific exploration through hands-on experiments, demonstrations, and self-driven studies where they develop and test their own hypotheses. He also highlighted how the program introduces green chemistry concepts and showcases mechanochemistry as an alternative to traditional solution-based chemistry. The talk aimed to inspire and inform others about how similar programs can be implemented at different institutions, helping more students explore scientific careers early on.

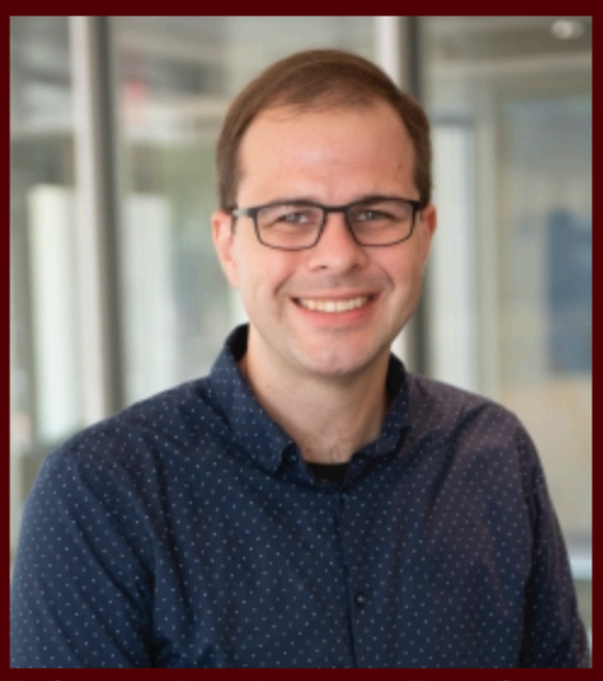
Petr Rehbinder's Impact on Materials Science and Mechanochemistry

The Science History Institute, in collaboration with members of the CMCC, recently released a scientific biography on Petr Rehbinder, the researcher who discovered that surface-active substances can reduce a material's surface energy and strength. Written by Anna Doel, the article delves into Rehbinder's early life, his groundbreaking scientific contributions, and the political forces that shaped his career.

Scan the QR code to read the full biography

Scan the QR code to access the Spanish version!
¡Escanee el código QR para acceder a la versión en español!

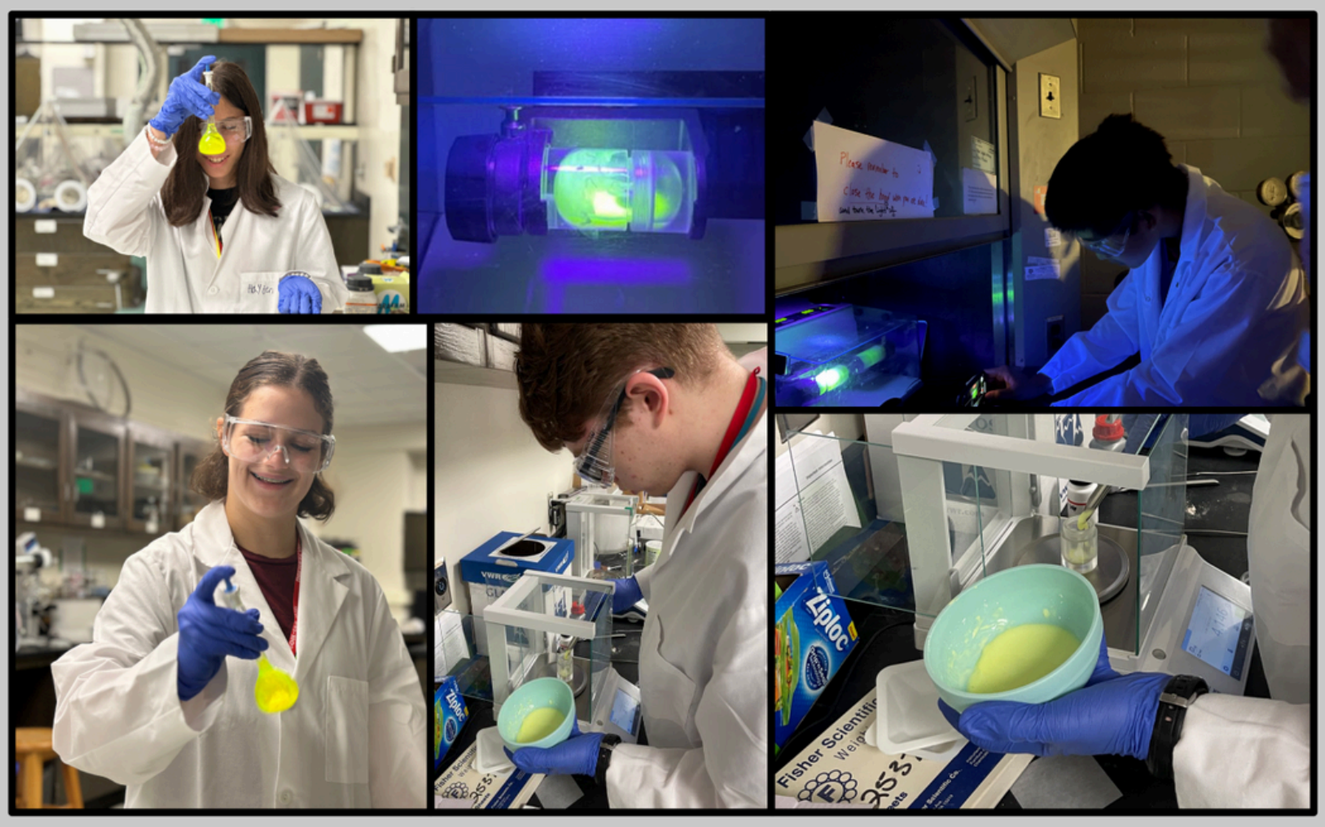
Dr. Daniel Tabor Showcases the Mechanochemical Reaction Database



Dr. Daniel Tabor, Assistant Professor at Texas A&M University, recently presented a poster at the Sanibel Symposium in St. Augustine, Florida, highlighting the Mechanochemical Reaction Database (MRD) developed by the NSF Center for the Mechanical Control of Chemistry (CMCC). The MRD is a collaborative effort involving researchers from Texas A&M University, Hunter College, Northwestern University, the City University of New York, and Vanderbilt University. It serves as a centralized platform where scientists can share reaction conditions and outcomes, helping to advance machine learning tools for more accurate predictions of mechanochemical reactions.

Scan the QR code to access the MRD!

Registration Now Open for YAP Camp: SMASH Chemistry



High school students interested in gaining hands-on chemistry experience can now register for the SMASH Chemistry course at Texas A&M's Youth Adventure Program (YAP). This weeklong camp offers a unique introduction to mechanochemistry, where students will explore how mechanical force can drive chemical reactions, an eco-friendly alternative to traditional methods. Participants will work with advanced equipment including mechanical mills and atomic force microscopes, gaining valuable lab experience. Don't miss this exciting opportunity to discover the power of force in chemistry!

Dates: July 20 - 25, 2025
Eligibility: Rising 9th to 12th graders (must be at least 15 by July 20, 2025)
Register now as spots are limited!

Hot Article Spotlight in *Material Horizons*

Studies of the mechanically induced reactivity of graphene with water using a 2D-materials strain reactor

Through the collaborative efforts of the Batteas and Rappe groups, their recent publication highlights how tunable mechanical strain can be utilized for mechanochemical reactions with graphene. Using Raman microspectroscopy, and a specially designed 2D-Materials Strain Reactor, they monitored the hydrolysis of water on a curved graphene surface. The study explores the unique trends in spectral behavior, complemented by density functional theory calculations that reveal the critical role of defects in facilitating strain-driven reactions with graphene.

To read the full article scan the QR code.