NGRPC 2025 Wednesday, March 19

Cochise

Transforming Waste into Resources: Harnessing Chemically Recyclable Materials

9:00-9:20 a.m.: Understanding and Enhancing PET Hydrolysis for Sustainable Chemical Recycling through Integrated Experimental and Molecular Dynamics Approaches

9:20-9:40 a.m.: Polyolefin adsorption on catalyst supports for chemical recycling **9:40-10:00 a.m.:** Photothermal Conversion Depolymerization of Commercial Plastics

10:00-10:20 a.m.: Functionalization of oligomers from recycled post-consumer plastics

10:20-10:40-BREAK

10:40-11:00 a.m.: Leveraging feedstock selection and characterization in lignocellulosic biorefineries for the production of sustainable polymers **11:00-11:20 a.m.:** Algae-Guayule Latex Biocomposites: Characterization and Mechanical Analysis for Sustainable Material Development **11:20-11:40 a.m.:** Bio-based Additive Manufacturing as a Valorization Pathway

11:20-11:40 a.m.: Bio-based Additive Manufacturing as a Valorization Pathway for Enzymatically Recycled Cotton Textile Waste

Lunch-Student Pavilion

Green Chemistry Approaches to Polymer Design and Synthesis

2:00-2:20 p.m.: A Systematic Approach to Assess the Size-Dependence of Polystyrene Model Microplastics on Human Serum Albumin **2:20 2:40 p m :** Marphology Dependent Jonia Conductivity in Block Conclumn

2:20-2:40 p.m.: Morphology-Dependent Ionic Conductivity in Block Copolymers Based on Polymer Ionic Liquids

2:40-3:00 p.m.: Alternative Solvent Systems for Metal-Free Ring-Opening Metathesis Polymerization

3:00-3:20 p.m.: Withdrawn

3:20-3:40 p.m.: Functionalization of [2Fe-2S] Metallopolymer Electrocatalysts through Click Chemistry

3:40-4:00 p.m.: Photothermal ATRP via Vitamin B12 Derivative

NGRPC 2025 Wednesday, March 19

Pima

Process Design for Plastic Waste Reduction

9:00-9:20 a.m.: Multilayer Co-Extrusion: An Additive Manufacturing Method to Impart Improved Mechanical Properties to Recycled Polyolefins

9:20-9:40 a.m.: Targeted Separation Scheme of Polyurethane Depolymerization Products

9:40-10:00 a.m.: Liquidlike low-friction polymer brush finishes for textile microfiber shedding reduction

10:00 a.m.-10:20 a.m: Sustainable Vat Photopolymerization of Complex Functional Structures with Fast Dissolvable and Recyclable Supports **10:20-10:40-BREAK**

Polymer Composites and Nano Composites

10:40-11:00 a.m.: Development of a fibrous, reversibly-crosslinked, hydrogel composite with temporal control of magnetically-induced fiber alignment
11:00-11:20 a.m.: Utilizing surface-initiated atom transfer radical polymerization to fabricate well-defined magnetic polymer nanocomposites

11:20-11:40 a.m.: Machine Learning-Based Monitoring of Nanofiller Alignment Under Electric Field

Lunch-Student Pavilion

New Concepts in Polymer Design and Characterization

2:00-2:20 p.m.: The Utilization of Sulfur Feedstocks and Organic Comonomers for the Development of Infrared Transparent Plastic Optics

2:20-2:40 p.m.: Monitoring Bulk Photopolymerization Kinetics Using in-situ NMR Spectroscopy

2:40-3:00 p.m.: Construction of an in silico El Mass-Spectral Library for Polymeric Material Analysis using Pyrolysis-GC/MS and Machine Learning

3:00-3:20 p.m.: Directing network degradability using wavelength-selective thiolacrylate photopolymerization

3:20-3:40 p.m.: Blocky Polyethylene-Polycyclooctene Copolymers via Tandem ROMP/Hydrogenation

3:40-4:00 p.m.: Digital Light Processing Printing of Hydrogel Based on Rapid Diels-Alder Click Chemistry

NGRPC 2025 Wednesday, March 19

Coconino

Reversible, Switchable and degradable polymeric materials

9:00-9:20 a.m.: Functional Polymeric ROMP-Boranes with Tunable Chemistry **9:20-9:40 a.m.:** Bioinspired Recyclable Polymers for Rapid and Selective Heavy Metal Removal from Contaminated Water

9:40-10:00 a.m.: Elucidating the Nanoscale Interactions between Invertible Polymeric Micellar Assemblies and Biopolymer Cargo

10:00-10:20 a.m.: Immunomodulatory poly(alpha ketoglutarate) microparticles to enhance bone repair

Lunch-Student Pavilion

Reversible, Switchable and degradable polymeric materials

2:00-2:20 p.m.: Robust Self-Healing Adhesives Based on Dynamic Urethane Exchange Reactions

2:20-2:40 p.m.: Rapidly hydrolyzable polylactide containing salicylate additives **2:40-3:00 p.m.:** Understanding the Tradeoff Between Reprocessability and Mechanical Strength in Silicones

3:00-3:20 p.m.: Alternative poly (ester acetal)s as degradable replacement for commodity plastics

3:20-3:40 p.m.: Depolymerizable and recyclable luminescent polymers with high light-emitting efficiencies

3:40-4:00 p.m.: Withdrawn

NGRPC 2025 Thursday, March 20

Cochise

Carbon Capture, Utilization, and Storage

9:00-9:20 a.m.: Functionalized Fabric Matrix for Enhanced Efficiency in Direct Air Capture
9:20-9:40 a.m.: Experimentation for characterizing sorbents used in Direct Air Capture of CO2
9:40-10:00 a.m.: Biocompatible Polymers for CO₂, Capture and Delivery in Cyanobacterial Cultivation
10:00-10:20- BREAK

Polymer Composites and Nanocomposites

10:20-10:40a.m.: A study on the epoxy-based polymer nanocomposites and the role of the curing agent

10:40-11:00 a.m.: Experimental Study on CO2-Sensitive Gel-Type Sealant for sealing Leaky Carbon

11:00-11:20 a.m.: Sequestration Wellbores

11:20-11:40 a.m.: Fundamental Investigations into Ceramic Yield and Composition of Preceramic Polyoganodecaboranes and Polyorganodecaborane Grafted Nanoparticles

11:40 a.m.-12:00 p.m.: Mechanophore-Functionalized Thermosets: Advancing Multifunctionality for Structural Applications and Sustainability

12:00-12:20 p.m.: Synthesis and Characterization of Polyurethane Coatings Derived from Palm Olein/Recycled PET Polyols for Metal Surface Protection

Lunch-Student Pavilion

NGRPC 2025 Thursday, March 20

Pima

Polymers for Energy Applications

9:00-9:20 a.m.: Rapid and highly selective ion conduction via decoupling ion transport from polymer segmental relaxation in single-ion-conducting, polymer-blend electrolytes

9:20-9:40 a.m.: PNIPAM-based Polymers with Selective Absorption for Polar Liquid from Non-Polar Liquid

9:40-10:00 a.m.: Enabling bio-cathode with graphene coating via networking soy-protein and polydopamine for Li-S batteries

10:00-10:20 a.m.: Withdrawn

10:20-10:40 BREAK

Innovations at the Intersection: Advanced Processing, Sustainability and Chemically Reprocessable Materials

10:20-10:40 a.m.: Time-Dependent Mechanical Enhancement of Polylactic Acid Through Biaxial Cold Rolling

10:40-11:00 a.m.: Engineering the Future of Soft Materials: 3D Printing Bottlebrush Siloxane-Based Elastomers

11:00-11:20 a.m.: Sulfur-based optical polymers: Sustainable approaches to visible and infrared imaging and photonics

11:20-11:40 a.m.: Physical aging in additively manufactured PETG

11:40 a.m.-12:00 p.m.: Hydrogel Encapsulated Living Soil Sensors: Towards Detecting Bioavailable Phosphorus and Beyond

12:00-12:20 p.m.: Optimizing Porous PDMS via Freeze-Casting: Enhanced Moduli and Elasticity for Advanced Materials

Lunch-Student Pavilion