Arizona NASA Space Grant Consortium

Thirty-Fourth Annual Statewide Student Research Symposium

ARIZONA SPACE GRANT CONSORTIUM

Presentations by Space Grant Students from:

Arizona State University
Embry-Riddle Aeronautical University
Northern Arizona University
University of Arizona
University of Arizona - Yuma
Arizona Western College
Casa Grande Union High School
Central Arizona College
Glendale Community College
Phoenix College
Pima Community College

April 19th, 2025
Scottsdale, AZ

Saturday, April 19, 2025

8:30-8:45 a.m. WELCOME & INTRODUCTIONS

SKYSONG BUILDING 3, SYNERGY, LEVEL 1

Dr. Thomas Sharp, Director of Arizona State University NASA Space Grant

Room	Global Room SkySong Bldg 1, Level 2	Discovery Room SkySong Bldg 1, Level 3	Ingenuity Room SkySong Bldg 1, Level 3	Exploration Room SkySong Bldg 1, Level 3
TIME **(MST)**	**Moderators:** Timothy Swindle, UA Michele Zanolin, ERAU **Session A** **ASTRONOMY & SPACE PHYSICS** (9:00 AM – 3:00 PM)	**Moderators:** Anne Boettcher, ERAU Michelle Coe, UA **Session B** **PLANETARY SCIENCE** (9:00 AM – 2:30 PM) **---** **Session C** **EDUCATION & PUBLIC OUTREACH** **Moderators:** Anne Boettcher, ERAU Michelle Coe, UA (2:30 PM – 3:10 PM)	**Moderators:** Elliott Bryner, ERAU Jeremy Forsythe, NAU Thomas Sharp, ASU **Session D** **EARTH & ENVIRONMENTAL SCIENCE/ENGINEERING** (9:00 AM - 2:00 PM) **---** **Session E** **AERONAUTICS** **Moderators:** Elliott Bryner, ERAU Thomas Sharp, ASU (2:00 PM-2:40 PM)	**Moderators:** Hadi Ali, ERAU Catalina Aranzazu Suescun, ERAU Rosa Szurgot, ERAU Ahmed Sulyman, ERAU **Session F** **AEROSPACE TECHNOLOGY** (9:00 AM-1:30 PM) **---** **Session G** **EXPLORATION SYSTEMS ENGINEERING** **Moderators:** Rosa Szurgot, ERAU Ahmed Sulyman, ERAU (1:30 PM-2:40 PM) **---** **Session H** **TOPICS IN MATH, PHYSICS, AND CHEMISTRY** **Moderators:** Rosa Szurgot, ERAU Ahmed Sulyman, ERAU (2:40 PM-3:10 PM)

9:00-9:10	[A-1] *Lucas Murphy, Blake Schuetz* Energy Distribution of Cosmic Rays in ERAU Prescott	[B-1] *Emma Guinan* A Panspermia Origin for Venus Cloud Life	[D-1-2] *Taylor Alger, Skylar Catania* Cultivation on Mars: Improving Soil Fertility of MGS-1 using Green Compost Amendment	[F-1-2] *Kian Blackey, Aidan Maney, Claire Picht, Andrew Reynolds* Exploration of Model-Based Systems Engineering Methodologies for Modeling Pre-Existing Systems
9:10-9:20	[A-2] *Aleah Short* Using PDR Modeling Tools to Simulate Spectroscopic Observations from GUSTO	[B-2] *Lucienne Morton* Post-Asteroid-Impact Downstream Flooding Hazards		
9:20-9:30	[A-3] *Els Shepard* Comparison of Three-Dimensional Supernova Models and Stardust Compositions	[B-3] *Cade Smith* Comparative Mineralogy and Chemistry of Bennu and Oued Chebeika 002	[D-3] *Sicily Vicera* Climatological Analysis of Tempe Town Lake	[F-3] *Jasmine Garnett* Enhancing Mars Helicopter Performance with Tethered Flight and Active Flow Controls
9:30-9:40	[A-4] *Tyler Hinrichs* Analyzing Globular Cluster Systems in PLCK G165.7+67.0	[B-4] *Ava Campbell* Hydrogen Formation and Storage in Earth Mantle Minerals	[D-4] *Embrey Saville* Biological Soil Crust as a Nature-Based Solution for Radionuclide Immobilization and Reclamation of Abandoned Uranium Mines on the Navajo Nation	[F-4] *Regen Michon* Artificial Intelligence and Machine Learning for Space Structures
9:40-9:50	[A-5] *Jaxson Mitchell, Lara Ortelli* Harnessing the Φn Transform for Early Warning of Neutron Star-Black Hole Binary Events	[B-5] *Sam Phippen* Constructing a Comprehensive Database of Planetary Maps	[D-5] *Nandini Manepalli* Metal Usage in Ancient Protein Domains	[F-5-6] *Bruce Noble, Ela Ozatay, Joseph Ribaudo, Frederick Wadnola III* EagleSat 2
9:50-10:00	[A-6] *Hunter Brooks* Storming the CASTL: A MCMC Tool for Spectral Parameter Fitting	[B-6] *Nidhi Nirwan* Petrography of New Basaltic Shergottite Northwest Africa 17234	[D-6] *Alexis Bass* Evaluating Sustainable Agriculture in Extraterrestrial Regolith: The Role of AM fungi and Fertilizers	
10:00-10:20	Midmorning Break & Refreshments SkySong Building 1, Level 3			
10:20-10:30	[A-7] *Dario Walter-Cardona* Nonlinear Differential Equations from a Vector Model of Lorentz Symmetry Breaking	[B-7] *Tatiana Asadourian* Changes in pH During Glycine Entrainment in Halite Crystals: A Ceres Analogue	[D-7] *Jasmine Engel* Evaluating Revegetation Techniques for Enhanced Disposal Cell Covers	[F-7] *Brendan Perry* Electrodeless Local Force Generator Using Magnetohydrodynamics for Aerocapture
10:30-10:40	[A-8] *Naomi Carl* A Stellar Renaissance: Exploring the Star Formation of a Spiral Galaxy	[B-8] *Savannah Smith* An Analysis of the Particle Size Frequency Distribution of an Aggregate Bennu Sample	[D-8] *Tayler John* Mapping Lead Exposure Risk: A Spatial Analysis of Vulnerable Communities	[F-8] *Athul Kodancha* ADCS Testbed

10:40-10:50	[A-9] *Ari Chai, Ambroise Juston* Birefringence Testing of AlGaAs Mirrors	[B-9] *Jacob Shoulders* Synthetic Approaches to Creating Hole Transport Materials	[D-9] *Kadin Pulliam* Exploring the Dynamics of Cell Morphology and Organic Carbon Concentration	[F-9] *Nathaniel van der Leeuw* Overcoming Impact: Deformable Drones for Dynamic Operations
10:50-11:00	[A-10] *Rachel Honor* SKYSURFIR: Catching Light Waves	[B-10] *Karla Paredes Aguilar* Terrestrial Alkaline Lakes as Analogs for Extraterrestrial Aqueous Environments	[D-10] *Mateo De La Torre* Using Spherical Slepian Functions to Estimate Regional Ice Loss from Glaciers	[F-10-11] *Benjamin Higgins, Philipp Shchetinin, Aaron Tulino* Radio Frequency Identification Security for IoT Airport Infrastructure
11:00-11:10	[A-11] *Naomi Borg* GeNS Mechanical Loss Measurement	[B-11] *Zoe Durica* Age of Metamorphism Documented by Monazite in the Orocopia Schist at Cemetery Ridge, AZ	[D-11] *Simon Fronmueller* Impact of Trace Metal Abundances on Microbial Community Composition and Diversity	
11:10-11:20	[A-12] *Jakob Perivolotis* Detecting Overlooked High Redshift Caustic Transients in MACS J0416.1-2403	[B-12] *Veronica Klawender* Viability of Methanogens in the Ice Shell of Europa	[D-12] *Johnelle Gonzales* Determining the Best-fit Function for Modeling the Aeolian Sediment Vertical Mass Distribution and Transport for an Active Dune Field with both Felsic Sand and Basaltic Cinders	[F-12] *Makena Wheeler* Cryogenic Cooling of a 3D Printed Cone Model for Hypersonic Wind Tunnel Experimentation
11:20-11:30	[A-13] *Isabella Olin* Galaxy Evolution: Investigating Paths of Reddening Through Machine Learning Models	[B-13] *Andrea Blake* Science Communication	[D-13] *Aseem Rajopadhye* Barberton Greenstone Shale XRD Analysis	[F-13] *Dom Belasquez* Development of an Assistive Exoskeleton for a Space Suit
11:30-11:40	[A-14] *Jackson Headon* Analyzing the Near-Infrared Spectra of M and L-Dwarfs	[B-14] *Aaron McCray* Improving Lunar Crustal Magnetic Field Maps in the South Polar Region	[D-14] *CGUHS ASCEND* Development and Deployment of High-Altitude Balloon Payloads for Atmospheric Characterization and Mesh Network Prototyping	[F-14] *Gabriella Mayrend* Models, Testing and Public Affairs: The Case for Crash Test Dummies
11:40-11:50	[A-15] *Anthony Fabrega* Photometric Monte Carlo Simulation of Wolf-Rayet Wind-Eclipsing Binaries	[B-15] *Kirsten Bauck* Mapping Carbon from Space: Comparing Satellite Biomass Models in NASA's Arctic Boreal Vulnerability Experiment (ABoVE)	[D-15] *ASU ASCEND* ASU StratoDevils: Advancing Real-Time Data Processing in High-Altitude Balloon Systems	[F-15] *Hal Ingram* Single-Filter Measurement Results
11:50-12:00	Return to SkySong Building 3, Synergy, Level 1			
12:00-12:50	**Lunch, SkySong Building 3, Synergy, Level 1**			

12:50-1:00	Return to SkySong Building 1, Breakout Rooms			
1:00-1:10	[A-16] Megan Miller Predicting the Zodi: Hubble Space Telescope Images Need Better Zodiacal Light Models!	[B-16] *Linae Larson* Impact-induced Spallation on Icy Moons and its Potential Effects on Habitability	[D-16] *Madelaine Stockman* Saguaro and Nurse Rocks: What are the Underlying Variables	[F-16-17] *Heerok Das, Hayden Marchinek, Jasmine Martinez Castillo* Spatial Heterodyne Interferometric Molecular Cloud Observer (SHIMCO), a Suborbital Sounding Rocket Mission
1:10-1:20	[A-17] *Francesco Busini, Diego Spross* High Mass X-Ray Binaries: Stars that Sculpt the Universe	[B-17] *Charly Bisson* Observing the Effects of Allometric Scaling Laws in the Organization of Microbial Ecosystems	[D-17] *Colin Boecker-Grieme* Computationally Modelling the Phospholipid Membrane	
1:20-1:30	[A-18] *Keenan Fiedler* Creating a Galaxy Cluster Simulation to Constrain Cosmology	[B-18] *Dora Elalaoui-Pinedo* Investigating Enigmatic Pits in the North Polar Layered Deposits of Mars	[D-18] *Anneli Sorensen* Optimizing Arctic Ice Preservation	[F-18] *Logan Conrad* SKYSURF-IR: Assessing JADES Completeness
1:30-1:40	[A-19] *Jake Markovsky* Modeling of Light Curves from Core Collapse Supernovae	[B-19] *Connor Derusseau* Low Distortion Map Projections for Mars	[D-19] *Tye Ropati* Fan and Fill in the Safford Basin	[G-1] *Supriya Roy* Discovering Optical Imaging Biomarkers for Early Detection of Gastrointestinal Cancers
1:40-1:50	[A-20] *Sara Jones* Meteor Crater LWA Station	[B-20] *Emily Clark* Space Weathering of Carbonaceous Asteroids	[D-20] *Aiden Harper* Harvesting Horizons: Predictive Modeling for Crop Loss and their Telecoupled Supply Chain Impacts	[G-2] *Rayna Hylden* Perovskite Performance on Glass and Metal Alloy Substrates
1:50-2:00	[A-21] *Breelyn Cocke* An Archetype of a Stripped Wolf-Rayet Binary	[B-21] *Eleanor Cornish* Inferring the Presence of Oceans on Earth-like Exoplanets	[D-21] *Emily Speckman* Flood Patterns in East Coast Catchments: How have they changed?	[G-3] *Molly Auer* Examining Effects of Post-Processing Operations on Laser Powder Bed Fusion 3D Printed Parts
2:00-2:10	[A-22] *Megan Harrison* Mapping HCN Gas within the L1495 Filament of the Taurus Molecular Cloud to Probe for Large-Scale Flow	[B-22] *Ryan Wochner* Measuring Optical Constants for Semi-Heavy and Heavy Water	[E-1] *Anna Gold* Effect of Upstream Screens on Flow Unsteadiness in a Supersonic Wind Tunnel	[G-4] *Chloe Gustafson* Using Heat Stress to Mitigate Physiological Decline During Long-term Spaceflight
2:10-2:20	[A-23] *Miriam Biehle* Improving the Detection and Characterization of Standing Accretion Shock Instability Using Gravitational Waves	[B-23] *Audrey Smith* Investigation of the Role of Vapor Pressure Differences Between H_2O and D_2O	[E-2] *Lina Youssfi* Boundary Layer Separation over Porous Media	[G-5] *Dillan Synan* Selective Laser Etching of Slumped Mirrors for X-Ray Astronomy
2:20-2:30	[A-24] *Jack Kohm* A Differentiable Action-Space Framework for Stellar Stream	[B-24] *Kiera Charley* A Direct Imaging Search for Substellar Companions around B &	[E-3] *Sean Young* Development of a Low-Cost High Altitude Manned Balloon Capsule	[G-6] *Cristo Lopez Rosas* Acoustic Levitation Bioassembly of 3D Tissue Constructs for Radiation

	Clustering and Milky Way Potential Constraints	A Stars		Research
2:30-2:40	[A-25] *Julio Corona* Characterizing the Cosmological Dependence of the Lognormal Model	[C-1] *Abigail Clerget, Taylor Hobbs* Facilitating Women's Success in Software Engineering through the Exploration of Non-traditional Educational Environments	[E-4] *Emanuele Bossi, Francesco Busini* Human-AI Symbiosis	[G-7] *Sierra Monreal* Investigation of Flexible Perovskite Solar Cells for Space Applications
2:40-2:50	[A-26] *Hailey Nelson* Exploring the Foundation of Life in the Universe with Ultrafast Dynamics	[C-2] *James Moore* The Development Process of Educational Space Focused Entertainment		[H-1] *Thomas Herrmann* The Ionic Liquid CAGE Promotes and Stabilizes the Formation of Secondary Structures in Viral Capsid Proteins
2:50-3:00	[A-27] *Ashton Cardona* Spectral Emisson Distributions of Galaxy Pair VV191	[C-3] *Penny Duran* Science Writing with University Communications		[H-2] *Andrew Ortega* Building Computational Models to Understand the Interplay Between Climatic Factors, Mobility, and Vector-borne Disease Dynamics
3:00-3:10		[C-4] *Eyan Weissbluth* The Role of Philosophy of Science in Science Education		[H-3] *Eric Vaughn* Spectroscopic Insights into CO and CO_2 Mixtures: Implications for Planetary Environment Analysis
3:10-3:20	Return to SkySong Building 1, Synergy, Level 1			
3:20-4:30	**ASCEND Poster Session** **SkySong Building 1, Synergy, Level 1** Closing Session			