

Abstract ID	Presenting Author Last Name	Presenting Author First Name	Session	Application Name
5321	Roudebush	Deborah	(AA) 21st Century Physics in the Classroom I	Planning Effective Professional Development
5401	Kozminski	Joseph	(AA) 21st Century Physics in the Classroom I	Renewable Energy and Climate Change in the Classroom and Lab
4774	Beskin	Ilya	(AB) Apparatus @ Home	Take-home Experiment: Student-led Exploration of Coupled Harmonic Oscillators
5266	Massa	Michael	(AB) Apparatus @ Home	Lab Kits for 'At-Home' Experiments in Physics for Life Sciences
5309	Vigil	Melissa	(AB) Apparatus @ Home	Using Circuit Kits and LEDs to Teach Optics at Home
5117	Smith	Donald	(AC) Computation and Modeling to Non-science Majors I	Teaching Machine Learning to Non-Scientists
5345	Titus	Aaron	(AC) Computation and Modeling to Non-science Majors I	Using Computation to Make General Education Courses Contemporary and Compelling
4543	Toggerson	Brokk	(AD) Diversity, Equity, and Inclusion in K-12	Equity in Introductory Physics Through Invitational Phrasing in Question Solicitation
5181	Desai	Anmol	(AD) Diversity, Equity, and Inclusion in K-12	ULAB: An Accessible, Peer-Led Framework for Facilitating Undergraduate Research Experiences
5437	Quichocho	Xandria	(AD) Diversity, Equity, and Inclusion in K-12	Critical Investigations of Physics Identity at HSIs
5481	Satoh	Naomi	(AD) Diversity, Equity, and Inclusion in K-12	Exploring Identity Formation of Ethnic and Gender Minorities in Physics
5599	Zamarripa Roman	Brian	(AD) Diversity, Equity, and Inclusion in K-12	A Critical Reframing of STEM Students' Support and Mentorship Channels
4551	Hu	Peter	(AF) PER: Curriculum and Instruction I	Clicker Question Sequence on Uncertainty Principle: Virtual and In-Person Implementation
5132	Kushimo	Tunde	(AF) PER: Curriculum and Instruction I	Investigating Students' Strengths and Difficulties in Quantum Computing
5376	Hansen	John	(AF) PER: Curriculum and Instruction I	Curricular Analytics in Physics
5453	Felker	Zachary	(AF) PER: Curriculum and Instruction I	Planning Prompt Surveys to Encourage Early Completion of Homework Assignments
5660	Cummings	Karen	(AF) PER: Curriculum and Instruction I	Revitalizing the Laboratory Curriculum at a Research-Intensive Institution
4625	Justice	Paul	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	Impact of Mathematical Reasoning on Students' Understanding of Quantum Optics
4822	Hewagallage	Dona	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	Exploring the Factors Affecting the Expert-like Scientific Attitudes
5233	Meltzer	David	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	Realistic Assessment of Students' Mathematical Preparation in Introductory Physics Courses
5328	Heckler	Andrew	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	The Evolution of Accuracy and Speed in Online Mastery practice
5454	Kelly	John	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	Examining Student Reasoning: A Replication Study at an HBCU
5654	Byrd	John	(AG) PER: Student Content Understanding, Problem-Solving and Reasoning I	Exploring the Origins of Physics Student Misconceptions in Mathematics
5231	Rutberg	Joshua	(AH) Training Learning Assistants and Graduate Students to be Effective Lab Assistants I	Training Novice GTAs and LAs to Teach ISLE-Based Labs
5305	Alicea-Munoz	Emily	(AH) Training Learning Assistants and Graduate Students to be Effective Lab Assistants I	Classroom Observations As Part of TA Training
4742	Jensen	Steuard	(BA) 21st Century Physics in the Classroom II	Lessons from Extra Dimensions: Rotations Were Bivectors All Along
4776	Freericks	James	(BA) 21st Century Physics in the Classroom II	Teaching Measurement to Prepare for Quantum Sensing
5112	Roudebush	Deborah	(BA) 21st Century Physics in the Classroom II	21st Century Physics Integrated into the High School Physics Curriculum
5326	Moore	Christopher	(BA) 21st Century Physics in the Classroom II	(Cancel) Sailing Stones As an Anchoring Phenomenon for Kinematics
5597	Norris	Peggy	(BA) 21st Century Physics in the Classroom II	Dark Matter Activities as a Phenomenon for MS/HS Standards
5624	Perry	Spencer	(BA) 21st Century Physics in the Classroom II	The Development of a Hypersonic Curriculum: Initial Results
5210	Cwik	Sonja	(BB) Assessing and Improving Equity in Physics Learning Environments I	Not all Disadvantages Are Equal: Investigating Grades and Motivational Beliefs
5355	Stewart	John	(BB) Assessing and Improving Equity in Physics Learning Environments I	The Effect of Prior Preparation on Students Underrepresented in Physics
5109	Lewsirirat	Sarat	(BC) Being a Student-Ready Physics Course	Introductory Physics Students' Concerns about Transitioning to College
5211	Kamenetzky	Julia	(BC) Being a Student-Ready Physics Course	Reflections on An Initial Implementation of Mastery-Based Testing
5216	Eichenlaub	Mark	(BC) Being a Student-Ready Physics Course	Asking What Happens
5473	Pollard	Benjamin	(BC) Being a Student-Ready Physics Course	Un-grading Physics Classes to Support all Students Succeeding
5596	Graessle	Raeghan	(BC) Being a Student-Ready Physics Course	I Eliminated Due Dates and the Result Shocked Me
5722	Schoene	Elizabeth	(BC) Being a Student-Ready Physics Course	The "Spaghetti" Approach to Equitable, Culturally Responsive, and Accessible Classrooms.
4508	Turunen	Hannu	(BD) Best Practices in Educational Technology I	Physics Teaching at Teams combined with SharePoint and Moodle
4715	Vijay	Y	(BD) Best Practices in Educational Technology I	(cancel) Quantum Science in Visible Range
5190	Krivosheev	Tatiana	(BD) Best Practices in Educational Technology I	Using a Capstone Experience in the Introductory Physics Classes
5335	Radtke	Jeffrey	(BD) Best Practices in Educational Technology I	Laboratory Instruction Using Radon and Its Progeny
5671	McColgan	Michele	(BD) Best Practices in Educational Technology I	Augmented Reality Models of Physics Concepts
5712	Schwartz	Megan	(BD) Best Practices in Educational Technology I	Nevertheless, She Persisted: The Impact of Persistence in Computational Education
4737	Porter	Anne Marie	(BE) Challenges Facing Women in Physics (AIP Report)	Challenges Facing Women in Physics
5243	Mohan	Kirtimaan	(BF) Computation and Modeling to Non-science Majors II	Modeling Diffusion for Life Science Majors by Incorporating Computation
5327	Weller	Daniel	(BF) Computation and Modeling to Non-science Majors II	Video Evidence of Computational Thinking Practices in High School Physics
5407	DiCaro	James	(BF) Computation and Modeling to Non-science Majors II	A Long-term Assessment of Computational Activities in an Astronomy Course
5534	Orban	Chris	(BF) Computation and Modeling to Non-science Majors II	Reinventing the STEMcoding Project through the Pandemic
5693	Mack	Lillianna	(BF) Computation and Modeling to Non-science Majors II	Evaluating Patterns Across Educators in their Reflection of Computational Thinking
6761	Rogers	Jake	(BF) Computation and Modeling to Non-science Majors II	Understanding Physics Identity in Computationally Integrated Physics Classrooms
5098	Werth	Alexandra	(BG) PER: Curriculum and Instruction II	Engagement in collaboration and teamwork using Google Colaboratory
5218	Yarbrough	Scott	(BG) PER: Curriculum and Instruction II	Investigating Student Performance in a Hybrid-Flipped Modern Physics Course
5370	Ahmed	Sheehan	(BG) PER: Curriculum and Instruction II	How Students Evaluate their Work in an ISLE-based Physics Course
5371	Jammula	Diane	(BG) PER: Curriculum and Instruction II	What Do Large Introductory Physics ISLE-based Courses Look Like?
5372	Makowski	Patrick	(BG) PER: Curriculum and Instruction II	Teaching A Planned Constructivist ISLE Curriculum in A Student-centered Way
5642	ismael	Safana	(BG) PER: Curriculum and Instruction II	Improving student understanding of the operational definition of electric field*
4758	Scherr	Rachel	(CA) Art and Science of Teaching	Inviting Undergraduates into the Art and Science of Teaching
5194	Perkins	Katherine	(CA) Art and Science of Teaching	The Art and Science of Teaching with PhET Simulations
5737	Belloni	Mario	(CA) Art and Science of Teaching	An Experiment-First and Inclusive Approach to Teaching Introductory Physics
5415	Li	Yangqiuting	(CB) Assessing and Improving Equity in Physics Learning Environments II	The Importance of Inclusiveness of Learning Environment in Promoting Equity
5549	Richardson	Arlisa	(CB) Assessing and Improving Equity in Physics Learning Environments II	TEAMUP: The Time is Still Now...Two years later

4605	Dittrich	Toby	(CC) Astronomy Paper	Modern Eddington Experiment
5209	Trucks	Jesica	(CC) Astronomy Paper	Does a Planetarium Show Achieve its Learning Goals for Audiences?
5600	A	Puneeth	(CC) Astronomy Paper	Calculating Roche Limit Of A Planet Moon System
5625	Rao	Rolex	(CC) Astronomy Paper	Improvements on the Attractive Mass Discussion
5708	Lindell	Rebecca	(CC) Astronomy Paper	Augmented Reality Visualizations for Teaching Lunar Phases
5140	Dancy	Melissa	(CD) Diversity, Equity, and Inclusion: Theoretical Frameworks and Methodologies	White Male Physicists Sense-making Around Equity in STEM
5158	Wood	Laura	(CD) Diversity, Equity, and Inclusion: Theoretical Frameworks and Methodologies	Analyzing and Representing Observational Fieldnotes through Sketching
5641	Swirtz	Madison	(CD) Diversity, Equity, and Inclusion: Theoretical Frameworks and Methodologies	Queering methodologies in physics education research
5680	Oleynik	Daniel	(CD) Diversity, Equity, and Inclusion: Theoretical Frameworks and Methodologies	Disabled Students' Narratives: The Epic, The Tragedy, and The Surreal
5718	Williams	Stephanie	(CD) Diversity, Equity, and Inclusion: Theoretical Frameworks and Methodologies	A Critical Discourse Analysis Framework for Physics Education Research
4607	Argudo	David	(CE) Educational Technology As A Double-edged Sword	Using linear elasticity to study the wave-motion of flexible strings
4711	Nunes Jr.	Geoff	(CE) Educational Technology As A Double-edged Sword	Graphing and Curve Fitting for Introductory Physics
5208	Bickel	Jessica	(CE) Educational Technology As A Double-edged Sword	Utilizing Perusal Collaborative Reading to Facilitate Learning in Introductory Physics
5307	Powers	Nathan	(CE) Educational Technology As A Double-edged Sword	Choosing a sandbox for project-based labs
5539	Alshahrani	Mohammad	(CE) Educational Technology As A Double-edged Sword	Effect of Selecting Right Coordinates System On Understanding Introductory Courses
5584	Marticion	Jeovanny	(CE) Educational Technology As A Double-edged Sword	Sinugbuanong Binisaya Nga Physics: Culture-Based Material for Physics Learning
4517	Haider	Zarar	(CF) High School	Searching for Ultra-Short-Period Planets using a Deep Neural Network
4523	Kernohan	James	(CF) High School	Starting the year with Diversity
5179	Stoeckel	Marta	(CF) High School	Evidence-Based Reasoning for Integrated STEM
5393	Huynh	Tra	(CF) High School	Physics teachers integrating social justice with science content
5700	Bornhorst	Cherie	(CF) High School	(Cancel) Physics & Life
5710	Agu	Philomena	(CF) High School	Inclusive and Equitable Curriculum and Assignments for Minority Physics Students
4557	Tobochnik	Jan	(CG) Open Source Physics	Using Physics Ideas in Agent-based Modeling of Social Systems
4621	Cox	Anne	(CG) Open Source Physics	Open Source Physics for all ages
4738	Gallis	Michael	(CG) Open Source Physics	Novel Laboratory Activities Emboldened by Open Source Physics
4767	Esquembre	Francisco	(CG) Open Source Physics	WebEJS: A fully Web-based Version of Easy JavaScript Simulations
5343	Titus	Aaron	(CG) Open Source Physics	Incorporating project-based learning into your physics courses with OSP
5604	Barbato	Lyle	(CG) Open Source Physics	OSP's Hidden Variables
5717	Rao	Rolex	(CG) Open Source Physics	Two Different Representations of Complex Number and their Applications
4548	Maries	Alexandru	(CH) PER: Assessment, Grading and Feedback I	Evolution in Student Conceptual Understanding of Energy and Momentum
4634	MA	SHIHONG	(CH) PER: Assessment, Grading and Feedback I	The Assessment of Introductory-Physics Course by Item Response Theory
5104	Pressler	Paige	(CH) PER: Assessment, Grading and Feedback I	Reflective Writing in Physics I
5245	Young	Nicholas	(CH) PER: Assessment, Grading and Feedback I	Who Answers Complex Multiple-choice Questions in Physics Correctly?
5433	Wang	Jianlan	(CH) PER: Assessment, Grading and Feedback I	(Cancel) The Impact of Learning Assistants' PCK-Q on Students'
5653	Zimmerman	Charlotte	(CH) PER: Assessment, Grading and Feedback I	Assessing Physics Quantitative Literacy Focused on Conceptualizing Algebraic Ideas
4553	Cwik	Sonja	(DD) PER: Diversity, Equity & Inclusion I	Women Have Lower Physics Self-efficacy Controlling for Grade
4747	Santana	Lisabeth	(DD) PER: Diversity, Equity & Inclusion I	Investigating Experiences of Women in Color in Physics and Astronomy
5232	Sundstrom	Meagan	(DD) PER: Diversity, Equity & Inclusion I	Gender Bias in Peer Recognition Across Course Levels and Contexts
5312	Changstrom	Jessica	(DD) PER: Diversity, Equity & Inclusion I	Where women of color earn physics degrees: Fact and fiction
5559	Hubenig	Katelynn	(DD) PER: Diversity, Equity & Inclusion I	Exclusionary Fields or Departments?: Undergraduate Degrees for Women of Color
6610	Nodurft	Dawson	(DD) PER: Diversity, Equity & Inclusion I	Analysis of Free Supplemental Resources Impact on Diverse Student Body
5130	Henderson	Charles	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	Characteristics of Departments with High-use of Active Learning
5198	Hull	Michael	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	Supporting Pre-Service Teachers in Building Upon Student Ideas in Instruction
5213	Fox	Michael	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	Does social justice from the top trickle down?
5283	El-Adawy	Shams	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	Personas for Supporting Physicists' Engagement in Informal Education
5310	Khong	Hien	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	Undergraduates Develop their Imagined Future Professional Selves
5474	Hass	Christopher	(DE) PER: Student and Instructor Support & Professional Development, Program and Institutio	How Can PERers Support Emerging Community Members' Self-efficacy?
4773	Stewart	John	(DF) Physics Education Research in the K-12 Classroom, Physics Majors: High School to Doct	Exploring Factors Influencing the Retention of Physics Majors
4855	Zeidell	Andrew	(DF) Physics Education Research in the K-12 Classroom, Physics Majors: High School to Doct	Alumni Engagement in Undergraduate Physics and Astronomy Departments
5099	Galanti	Terrie	(DF) Physics Education Research in the K-12 Classroom, Physics Majors: High School to Doct	Integrating Computation in the Algebra-Based High School Physics Classroom
5574	Hosmer	Paul	(DF) Physics Education Research in the K-12 Classroom, Physics Majors: High School to Doct	Aspects of Classical Education Movement In Physics Education Research Literature
4629	Gelderman	Richard	(DG) Supporting Physics Teaching with a Planetarium	Getting to Mars – Applied Astrodynamics Visualized
6233	Yoder	Diane	(DG) Supporting Physics Teaching with a Planetarium	Seeing the Whole Picture: Practical Uses for the Electromagnetic Spectrum
6234	Lawler	Jannette	(DG) Supporting Physics Teaching with a Planetarium	Student's Choice Awards:Preliminary Results of a Survey on Planetarium Impact
4729	Becchetti	Frederick	(DH) Upper Division Undergraduate	Mie Optical Scattering as an Analog to Nuclear Scattering
5214	Crossette	Nate	(DH) Upper Division Undergraduate	Social network analysis of student collaboration in pandemic-affected courses
5322	Porter	Christopher	(DH) Upper Division Undergraduate	Milestones and Attitudinal and Motivational Factors in Physics Graduate Students
5387	Sayer	Ryan	(DH) Upper Division Undergraduate	Impact of pre-class reading and peer instruction in quantum mechanics
5475	Moylan	Patrick	(DH) Upper Division Undergraduate	(Canceled) Velocity Reciprocity and the Relativity Principle
5583	Lancaster	Jarrett	(DH) Upper Division Undergraduate	Simulating quantum dynamics with IBM quantum computers
5587	Johnson	Brandon James	(DH) Upper Division Undergraduate	Formally Organized Graduate Student Study Groups: Let's Talk About That
4784	Lui	Kristine	(DI) Supporting Faculty and Students in the Era of COVID	Using Mutual Mentoring to Mitigate Isolation for TYC Physics Faculty
4788	Walsh	Courtney	(DI) Supporting Faculty and Students in the Era of COVID	Faculty Members' Experiences During the COVID-19 Pandemic
4866	Ivie	Rachel	(DI) Supporting Faculty and Students in the Era of COVID	Supporting Students in Current Times of Change

5572	Edwards	Emily	(EA) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	Progress report on K-12 Quantum Education
5590	Gil	Leron	(EA) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	TBD
4726	White	Susan	(EB) Diversifying Through Connections at TYCs I	Diversity in Physics in TYCs: People, Places, and Pedagogy
4732	Denicolo	Glenda	(EB) Diversifying Through Connections at TYCs I	TYC Interests and Needs, and DEI Materials
5247	Des Jardins	Angela	(EC) High Altitude Ballooning I	Nationwide Eclipse Ballooning Project: Approaches for Guiding Student Learning
5316	Flaten	James	(EC) High Altitude Ballooning I	Overview of Educational Applications of Lighter-Than-Air Ballooning
4519	Nafria	Amritpal	(ED) General Topic Papers	Modification of Newton's Second Law of Motion
4859	Conrad	Brad	(ED) General Topic Papers	Trends in Physics Higher Education
5163	Stephens	Kayla	(ED) General Topic Papers	Inspiring the Next Generation of Students in Physics and Astronomy
5270	Zhang	Tom	(ED) General Topic Papers	Using Natural Language Processing in Clustering Student Behaviors
5448	Chhabra	Dr Rahul	(ED) General Topic Papers	In-medium Decay Constant of $Y(4008)$ and $\psi(4040)$ State
4752	Wheatley	Christopher	(EF) PER: Diverse Investigations I	Network Analysis of the BEMA with Modified Module Analysis-Partial
4763	Herne	Catherine	(EF) PER: Diverse Investigations I	Development of Self-Efficacy in an Advanced Physics Lab
4819	Pace	John	(EF) PER: Diverse Investigations I	Using Machine Learning to Predict Student Performance in Introductory Mechanics
5152	Stanley	Bryan	(EF) PER: Diverse Investigations I	Becoming an Informal Physics Program Leader: Experiences and Choices
5166	Ryan	Qing	(EF) PER: Diverse Investigations I	How Social Psychological Variables Affect Students' Performance in Introductory Physics
5347	Myers	Carissa	(EF) PER: Diverse Investigations I	A Mixed Methods Approach Towards Defining Students' Ranges of Self-Efficacy
4502	Mellen	Jillian	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	Predictors of Faculty Sentiment On Their Transition to Online Teaching
5253	Sharkey	Daniel	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	Investigating the Effect of Discipline in Mixed-reality STEM GTA Training
5417	Wu	Xian	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	Supporting Physics Instructors to Facilitate Effective and Inclusive Group Work
5487	Zohrabi Alae	Dina	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	Challenges and benefits of remote undergraduate research: A longitudinal study
5535	Sachmpazidi	Diana	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	A Leadership Institute's Role in Supporting Team-based Departmental Change
5609	Dalka	Robert	(EG) PER: Student and Instructor Support & Professional Development, Program and Institutio	Team-based approaches to programmatic resources: Who the Guide really guides
4708	Carlsmith	Duncan	(FA) Best Practices in Educational Technology II	Live Script Tutorials in Computational Magnetism
4793	Koenig	Kathleen	(FA) Best Practices in Educational Technology II	Incorporating affect in the design of interactive web-based problem-solving tutorials
5300	Countryman	Colleen	(FA) Best Practices in Educational Technology II	Gamifying Simulation to Improve Understanding and Attitudes Towards Electric Fields
5323	Duffy	Andrew	(FA) Best Practices in Educational Technology II	Using the TopHat Platform to Minimize Costs for Students
5651	Berggren	Calvin	(FA) Best Practices in Educational Technology II	Improving Assignments using the Nbgrader Extension for Jupyter
5715	Canright	Jared	(FA) Best Practices in Educational Technology II	Simulating Scientific Collaboration and Model Refinement With Virtual Reality
4871	Borish	Victoria	(FB) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	What Does it Mean to See Quantum Mechanics?
5325	Porter	Christopher	(FB) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	QuSTEAM: Developing a Modular Curriculum for a Diverse QIS Community
5637	Zwickl	Benjamin	(FB) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	Creating a Quantum Information Science and Technology Minor at RIT
5721	Bennett	Michael	(FB) Building a Quantum Information Science and Engineering Curriculum for a Diverse Comm	Diverse Pathways to the Quantum Industry at Q-SENSE
4592	Fermo	Raymond	(FC) Diversifying Through Connections at TYCs II	Embedded academic coaching at Montgomery College: Achieving the Promise Academy
5107	Snyder	Jennifer	(FC) Diversifying Through Connections at TYCs II	Community Building in Physics Classroom: A Pandemic Update
5374	Leak	Anne	(FC) Diversifying Through Connections at TYCs II	Understanding Hispanic Physics Majors' Expectations of Relationship-Building at Community College
5667	Carter	Tom	(FC) Diversifying Through Connections at TYCs II	Using Intrusive Advising to Improve Student Success
4631	Gelderman	Richard	(FD) Gender	Deserving of Nobel? The Harvard Computers and other Neglected Pioneers
5113	Moshfeghyeganeh	Saeed	(FD) Gender	Diversity of Performance and Choice of Physics by Female Students
5137	McCullough	Laura	(FD) Gender	An Update on Women's Leadership in Physics Education
5221	Smith	Madison	(FD) Gender	Impact of a Physics Camp on Girls' Critical Physics Identities
5318	Agrimson	Erick	(FE) High Altitude Ballooning II	High Altitude Balloon Directional Measurements of Cosmic Ray Shower Events
5602	Larimer	Randal	(FE) High Altitude Ballooning II	Nationwide Eclipse Ballooning Project Engineering Systems Overview
4724	Kline	Michael	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	Learning Vectors Online: Comparing Multiple-Choice to Drawing Vectors
5236	Moni Prakash	Harish	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	Algebra Accuracy and Response Time: Physics vs Common Math Symbols
5445	Leung	Promail K.Y.	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	Using 3D-printed Models to Help Students to Draw Free-Body Diagrams
5488	Maries	Alexandru	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	Improving Student Understanding of Static Equilibrium with an Interactive Tutorial*
5586	Fussell	Rebeckah	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	(Cancel) Machine Learning for Automated Coding of Survey Responses
5656	Kryjevskaja	Mila	(FG) PER: Student Content Understanding, Problem-Solving and Reasoning II	Teaching Reasoning Skills Necessary to Validate or Reject a Response
4730	Laverty	James	(FH) PER: Assessment, Grading and Feedback II	Supporting Instructors through Research Based Assessment
4857	Campbell	Jennifer	(FH) PER: Assessment, Grading and Feedback II	Using IBM's Watson as a Tool for Student Short-Answer Analysis
5139	Girotti-Hernandez	Daniela	(FH) PER: Assessment, Grading and Feedback II	Changes in Student Study Strategies from High School to College
5143	Shafer	Devyn	(FH) PER: Assessment, Grading and Feedback II	Study Habits of College-Bound High School Physics Students
5467	Izadi	Dena	(FH) PER: Assessment, Grading and Feedback II	Developing the Key Organizational Components Model for Informal Physics Programs
5620	Fairbanks	Matthew	(FH) PER: Assessment, Grading and Feedback II	The Pandemic and Introductory Mechanics Course Learning Outcomes
4515	Maier	Steven	(GA) Implementing Get the Facts Out Resources Locally & Regionally	Recruiting Teachers: What's that thing you do?
4845	Ruggerio	Marianna	(GA) Implementing Get the Facts Out Resources Locally & Regionally	Strengthening High School Teacher Quality Through a University Partnership
5200	May	David	(GA) Implementing Get the Facts Out Resources Locally & Regionally	Teachers quit at lower rates than most other professionals
5739	Grande	Lucia	(GA) Implementing Get the Facts Out Resources Locally & Regionally	700 Student Study: Increased Desire to Become A Teacher
4728	Winrich	Chuck	(GC) PER: Diversity, Equity & Inclusion II	Encouraging a Growth Mindset
5228	Rodriguez	Miguel	(GC) PER: Diversity, Equity & Inclusion II	International Graduate Student Perspectives and Implications for Physics Departments
5262	Christman	Elaine	(GC) PER: Diversity, Equity & Inclusion II	Examining Factors Related to Rural, First-Generation Student Persistence in STEM
5330	Perry	Jonathan	(GC) PER: Diversity, Equity & Inclusion II	Developing Belonging and Purpose in Introductory Courses for Non-Majors
5477	Abdurrahman	Fatima	(GC) PER: Diversity, Equity & Inclusion II	Cultural Beliefs and Systemic Inequity in Astronomy Graduate Programs

5564	Akubo	Mark	(GC) PER: Diversity, Equity & Inclusion II	Positioning and Intersectionality in An Inquiry-based Undergraduate Physics Lab
5577	Dela Paz Maca	Vanessa	(GC) PER: Diversity, Equity & Inclusion II	The Banking Model of Physics Education
4841	Pina	Anthony	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	Student-Constructed Eigenvalue Equations in Quantum Mechanics: A Symbolic Forms Analysis
5124	Riihiluoma	William	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	Network Analysis of Student Interpretations of Dirac Expressions Across Curricula
5176	Al Salmani	Fatema	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	Assessing Thinking Skills in Free-response Exam Problems: Covid vs. Non-covid
5184	Solorio	Christian	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	How Students Compare and Contrast the "Discreteness" of Quantum Representations
5269	Sowles	Em	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	Using Metacognitive Prompts to Explore Student Reasoning Trajectories*
5676	Phillips	Anna	(GD) PER: Student Content Understanding, Problem-Solving and Reasoning III	Pragmatic and Epistemic Agency in A Project-based Computational Physics Course
5290	Knaub	Alexis	(GE) PICUP Capstone Conference Report	Success and Remaining Challenges for PICUP and Integrating Computation
5589	Zimmerman	Todd	(GE) PICUP Capstone Conference Report	Exercise Sets, Faculty Commons, and Resources of the PICUP Website
5261	Lam	Michael	(GF) Pulsars and Radio Astronomy	Simplifying Pulsar Timing Array Science for Students
5271	Schmiedekamp	Carl	(GF) Pulsars and Radio Astronomy	Radio Astronomy Research Experiences for Undergraduates
5617	Gugliucci	Nicole	(GF) Pulsars and Radio Astronomy	Radio Astronomy Instrumentation and Analysis in Undergraduate Physics
5732	Lewandowska	Natalia	(GF) Pulsars and Radio Astronomy	Pulsars -The Story of the Stellar Clocks in the Sky
5603	Dana	Lauren	(HA) Chaotic Laboratories and Apparatus	Student Built Remote Chaotic Pendulums
5690	Wiegert	Craig	(HA) Chaotic Laboratories and Apparatus	Exploring Chaos by Creating Simulations of Nonlinear Systems
5703	Qualls	Joshua	(HA) Chaotic Laboratories and Apparatus	Semiclassical Mastermind
4636	Gaffney	Jon	(HB) Introductory Courses I	Lessons Learned from Teaching a Physics Sequence with Contract Grading
5191	Lee	Ting-Hui	(HB) Introductory Courses I	Instrument Projects for Acoustics Students Who Are Non-Science Majors
5201	Nelson	Peter	(HB) Introductory Courses I	Playing the Marble Game in Excel
5226	Good	Melanie	(HB) Introductory Courses I	Exploring Pseudoscientific Beliefs Among Undergraduate Students
5357	Gambrell	Justin	(HB) Introductory Courses I	Interviews on Computation in Introductory Physics: Reading Code is Everything!
5636	Miller	Paul	(HB) Introductory Courses I	Student Resilience: Advantages of a Hybrid NextGen PET Adaptation
4791	Constan	Zachary	(HC) Michigan State Physics Research	Nuclear Science for Everyone
5105	Tessmer	Stuart	(HC) Michigan State Physics Research	Undergraduate Physics Transformations at Michigan State University
5304	Jackson	David	(HD) Outreach through Social Media (4:00 to 5:20 PM)	All Things Physics: A Repository of Video Explorations in Physics
5386	Bailey	Nora	(HD) Outreach through Social Media (4:00 to 5:20 PM)	SciTok, Social Media, and Seeing Science
5646	Morrison	Andrew	(HD) Outreach through Social Media (4:00 to 5:20 PM)	Your Next Great Teaching Idea Is Just A Tweet Away!
5692	Franceschi	Geoffrey	(HD) Outreach through Social Media (4:00 to 5:20 PM)	Physics and Social media: Everyone's Tok'ing About It
4783	Peyravi	Mona	(HE) PER: Diversity, Equity & Inclusion IV	Fostering Group Work in Studio Physics: Developing an Instructor Guide
5119	Thapaliya	Arbin	(HE) PER: Diversity, Equity & Inclusion IV	Teaching Ultrasound to Undergraduates Using Project-based Learning Approach
5204	Nissen	Jayson	(HE) PER: Diversity, Equity & Inclusion IV	Moving Beyond 'p<0.05' to Investigate Similarities and Differences
5274	Euler	Elias	(HE) PER: Diversity, Equity & Inclusion IV	The Scale of it All: Students' Experiences of Spatial Scales
5348	Owens	Lindsay	(HE) PER: Diversity, Equity & Inclusion IV	Why Graduate Students Leave: Exploring Student Perspectives and Experiences
5406	Willison	Julia	(HE) PER: Diversity, Equity & Inclusion IV	Causal mapping analysis of Universal Design for Learning-aligned instructional changes
4842	Topdemir	Zeynep	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	Student Understanding of the Partial Derivatives in Curl and Divergence
5265	Susac	Ana	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	Construction and evaluation of the Conceptual Survey on Wave Optics
5337	Sahouria	Aubrey	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	Examining Student Confidence and Calibration in Introductory Physics
5427	Stump	Emily	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	"Quantum Weirdness": Physics Paradigm and Student Thinking About Experimental Uncertainty
5496	Stetzer	MacKenzie	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	Insights from an intervention designed to support consistent reasoning
5537	Stewart	Gay	(HF) PER: Student Content Understanding, Problem-Solving and Reasoning IV	Impact of eLearning on NextGen PET students' NGSS practice development
4623	Vonk	Matthew	(IA) 21st Century Physics in the Classroom III	What does 21st Century Physics Look Like?
5185	Traore	Papa touty	(IA) 21st Century Physics in the Classroom III	Flipped Classroom Model with A Light Board
5421	Gibbons	Thomas	(IA) 21st Century Physics in the Classroom III	Ocean Energy Imbalance and Climate Change in Beginning Physics
5452	Pope	Damian	(IA) 21st Century Physics in the Classroom III	What's New in Physics?
5630	Nyawa Ngassa	Joselin	(IA) 21st Century Physics in the Classroom III	The Study of Physics in Institutions
6070	Franklin	Donald	(IA) 21st Century Physics in the Classroom III	Science 100
4606	Vijayakumaran	Ponnampalam	(IB) Best Practices in Educational Technology III	Simple Innovative Hybrid Teaching Model to Make Hands on Experience
4750	Zoechling	Sarah	(IB) Best Practices in Educational Technology III	A Virtual and Interactive Learning Unit about Positron-Emission-Tomography
4820	Woodahl	Brian	(IB) Best Practices in Educational Technology III	Course Lectures: My Transition from Zoom to DaVinci Resolve
5121	Woodward	Roland	(IB) Best Practices in Educational Technology III	Blended Lab Teams: From Pandemic "hack" to Online Innovation
5455	Hill	Sam	(IB) Best Practices in Educational Technology III	Replacing the LMS as an ADHD Professor and Web Developer
5595	Jelovica	Lejla	(IB) Best Practices in Educational Technology III	Application of the Arduino Platform in Education
5479	Hogan	William	(IC) How Curt Hieggelke Contributed to Physics Education I	Curt Hieggelke in Joliet and Illinois
5542	Kanim	Steve	(IC) How Curt Hieggelke Contributed to Physics Education I	Curt Hieggelke and Tasks Inspired by Physics Education Research (TIPERs)
4540	Lee	Kevin	(ID) Innovations in Teaching Astronomy I	Teaching with Astronomy Smartphone Simulations
4868	Herrold	Ardis	(ID) Innovations in Teaching Astronomy I	Rubin Observatory's Approach to Improving Data Fluency
5129	Willoughby	Shannon	(ID) Innovations in Teaching Astronomy I	Space Exploration Activities for Introductory Astronomy
5302	Dobaria	Archana	(ID) Innovations in Teaching Astronomy I	A Spatial Curriculum for Teaching Seasons
5480	Mederer	Anna	(IE) PER: Curriculum and Instruction III	Scaffolding Writing in Physics Labs
5561	Nainabasti	Binod	(IE) PER: Curriculum and Instruction III	Role of Preparatory Physics Foundation Course in Student Success
5575	ismael	Safana	(IE) PER: Curriculum and Instruction III	Improving student understanding of the operational definition of electric field
5611	Olsen	Joe	(IE) PER: Curriculum and Instruction III	Student preferences about instructional explanation strategies in introductory physics classes
5634	Olsho	Alexis	(IE) PER: Curriculum and Instruction III	Improving Introductory Physics Students' quantitative Reasoning through Targeted Practice

5674	McKagan	Sarah	(IE) PER: Curriculum and Instruction III	ACORN Physics Tutorials for building on seeds of science
5170	Chini	Jacquelyn	(IF) PER: Diverse Investigations II	Modeling Pathways to Access in Physics Learning and Research Environments
5173	Amaral	Camila	(IF) PER: Diverse Investigations II	Qualitative Social Network Analysis and Applications in Physics Education Research
5361	Dachille	Frank	(IF) PER: Diverse Investigations II	Trajectories of Transfer Students Toward a Bachelor's Granting University
5465	Henderson	Rachel	(IF) PER: Diverse Investigations II	Using a Mixed Methods Approach to Study Complex Motivational Constructs
5593	White	Rachel	(IF) PER: Diverse Investigations II	Effectiveness of introductory physics laboratory courses in supporting learning goals
5672	hinrichs	brant	(IF) PER: Diverse Investigations II	Changing Notation That Represents Force Changes How Students Say It
4524	Boehlig	Thommy	(IG) Sports Meets Physics I	Kung Fu Physics
4743	Therolf	Sascha	(IG) Sports Meets Physics I	Tactile Reaction Training in Physics Classes
5469	Maloney	David	(JA) How Curt Hiegelke Contributed to Physics Education II	My Excellent Adventure with Curt (and Tom)
5783	Desbien	Dwain	(JA) How Curt Hiegelke Contributed to Physics Education II	How Curt Shaped My Entire Career and PER
4815	Daubert	Allison	(JC) Methods of Remediation in the Intro Physics Classroom	Resubmission Processes in University Lecture Classrooms
5110	Bugge	Danielle	(JC) Methods of Remediation in the Intro Physics Classroom	Revise and Resubmit: Authentic Engagement in the High-school Physics Laboratory
5720	Pinheiro	Jade	(JC) Methods of Remediation in the Intro Physics Classroom	Modeling A Remediation Policy Focused on Developing Epistemic Knowledge
4565	Li	Yanqiuqing	(JD) PER: Diversity, Equity & Inclusion III	Inclusiveness of learning environment mediates gender differences in learning outcomes
4580	Malespina	Alysa	(JD) PER: Diversity, Equity & Inclusion III	To whom do students believe a growth mindset applies?
5346	Dew	Matthew	(JD) PER: Diversity, Equity & Inclusion III	Equity in Student Equipment Usage for Remote and In-Person Labs
5422	Franklin	Maxwell	(JD) PER: Diversity, Equity & Inclusion III	Developing a Python tool to Categorize Motivation of Undergraduate Women
5426	Coffie	Camille	(JD) PER: Diversity, Equity & Inclusion III	Identifying Academic Ableism: Case Study of a UDL-Learning Community Participant
5645	McPadden	Daryl	(JD) PER: Diversity, Equity & Inclusion III	Planning for Participants' Varying Needs and Abilities in Qualitative Research
4570	Brundage	Mary	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	How often can students co-construct knowledge in quantum mechanics?
4635	Akinyemi	Abolaji	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	Perspectives on Evaluation Strategies
5183	Anderson	Austin	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	Observations of Student Resources in Introductory Programming Tutorials
5491	Rosen	Drew	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	Leveraging dual-process theories to improve student reasoning about air resistance
5562	Bott	Theodore	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	Relating Computational Thinking Practices and Problem Design Features
5711	Boudreaux	Andrew	(JE) PER: Student Content Understanding, Problem-Solving and Reasoning VI	Adapting a dual-process informed intervention strategy across content domains
5315	Vigil	Melissa	(JF) Sports Meets Physics II	Swords for Science
5379	Beverly	Nancy	(JF) Sports Meets Physics II	Biomechanics Replacing Mechanics
5492	Johnson	Joseph	(JF) Sports Meets Physics II	Hitting the Chains: Disc Golf Physics
5694	Zengel	Keith	(JF) Sports Meets Physics II	Gutterballs, Lip Outs, and Swirlies
4745	Palmer	William	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	(Cancel) The sesquicentenary of David Unaipon (1872-1967): First Australian scientist
5308	Archibeque	Benjamin	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	Critical Path Analysis of High School Student Physics Identity
5592	Gutmann	Brianne	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	Documenting the Impact of HSIs on Physics and PER
5626	Lyubimenko	Olena	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	Description of Experimental Features of Creating A Gradient Palladium-Hydrogen Alloy
5647	McDermott	Liam	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	Political Disability Identity: A Framework for Physics Education Research
5736	Petkie	Benjamin R.	(KA) Diversity, Equity, and Inclusion: Physics Education and Identities	Education Research on Un-grading
5096	Lewandowski	Heather	(KB) Introductory Courses, Introductory Labs/Apparatus	Student outcomes from a remote, large-enrollment, course-based undergraduate research experience
5126	Rundquist	Andy	(KB) Introductory Courses, Introductory Labs/Apparatus	CourseSource Physics: A new practitioner journal for physics educators
5259	LaVigne	Joseph	(KB) Introductory Courses, Introductory Labs/Apparatus	A Capacitive Liquid Level Sensor for Application Based Labs
5334	Brewer Sherer	Maggie	(KB) Introductory Courses, Introductory Labs/Apparatus	Modeling Ring Magnets: Non-linear, Damped Oscillators
5579	Stewart	Gay	(KB) Introductory Courses, Introductory Labs/Apparatus	Next Gen PET in a lecture-lab format!
5663	Richardson	Dean	(KB) Introductory Courses, Introductory Labs/Apparatus	Flipped vs. Traditional IPLS: Controlling the Control Variables
5368	Doty	Constance	(KC) PER: Student and Instructor Support & Professional Development, Program and Institutio	Student Perspectives of Mini-Studio GTAs' Roles in Resolving Group Challenges
5385	Bridges	Bill	(KC) PER: Student and Instructor Support & Professional Development, Program and Institutio	Identifying Epistemic Frames in Faculty Discourse Centered around Ethics
5461	Garcia	Tyler	(KC) PER: Student and Instructor Support & Professional Development, Program and Institutio	The Effect of Value-Focused Discussions on Scientists' Ethical Decision Making
5476	Ansell	Katie	(KC) PER: Student and Instructor Support & Professional Development, Program and Institutio	A Paradigm of Repair for Group Work in Introductory Labs
5483	Alesandrini	Anne	(KC) PER: Student and Instructor Support & Professional Development, Program and Institutio	Identifying Learning Assistants' Resources for Student-Centered Teaching
4520	Zubov	Igor	(KD) PER: Student Content Understanding, Problem-Solving and Reasoning V	Tools and Logic of Problem Solving in Physics
4709	Zu	Tianlong	(KD) PER: Student Content Understanding, Problem-Solving and Reasoning V	Effect of Guided Retrieval Practice and Feedback on Physics Problem-Solving
5258	Zich	Raymond	(KD) PER: Student Content Understanding, Problem-Solving and Reasoning V	Investigating introductory student difficulties reading electric field diagrams
5580	Verostek	Mike	(KD) PER: Student Content Understanding, Problem-Solving and Reasoning V	Making expert processes visible: how and why theorists use analogy
5652	Zhang	Muxin	(KD) PER: Student Content Understanding, Problem-Solving and Reasoning V	Challenges and successes in reconciling different ideas during group work
5404	Yang	Juan	(KE) Physics Teaching Around The World	Comparing introductory physics courses in the US and China
5550	Stocker	Dean	(KE) Physics Teaching Around The World	Teaching Physics in Sub-Saharan Africa
5594	Castiblanco Abril	Olga	(KE) Physics Teaching Around The World	(Cancel) Mathematization Of Physics for Teaching, From Phenomenology,
5707	Hechter	Richard	(KE) Physics Teaching Around The World	Teaching energy through calorimetry: insights from Canadian and Israeli perspectives
4563	Maier	Steven	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	Adult learning in a pre-service content course: Too soon?
5106	Snyder	Jennifer	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	Engaging Exams: Using Student Interviews and Engineering Design for Assessments
5217	Price	Edward	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	Emergent outcomes from a faculty online learning community
5598	Gugliucci	Nicole	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	The NextGenPET Curriculum and Beyond: Integrating the Sciences
5629	Miller	Paul	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	Student Resilience in COVID: Advantages of a Hybrid Adaptation
5638	Wedding Crowell	Kris	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	Effectiveness of Next Gen PET online
5697	Snyder	Tamara	(KF) Teaching & Supporting Future Teachers Using Next Gen PET	The results of Covid induced changes to a NextGenPET implementation
4790	Postiglione	Jake	(KG) Smart Phone-Based Labs	Smart Physics: a path to innovate laboratory physics experiences

4824	Rakestraw	David	(KG) Smart Phone-Based Labs	Resonant Acoustic Characterization of Coins: An Inquiry-Based Learning Activity
5212	Gavrin	Andy	(KG) Smart Phone-Based Labs	Smartphones in the introductory mechanics lab
5485	Monteiro	Martin	(KG) Smart Phone-Based Labs	Simple acoustics experiments during the pandemic
5563	Atherton	Timothy	(KG) Smart Phone-Based Labs	Integrating Smartphones and Making in a Computational Physics Course
4736	Hernandez	Jessica	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Place-Based Education: Situating Energy and Climate Change in Students' Communities
5150	Lock	Frank	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	CLIMATE SCIENCE FOR TEACHERS
5160	Micoloi	Magdalena	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Students' critical thinking skills in relation to climate change
5244	Aryal	Bijaya	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Exploration of Students' Attitudes and Self-regulation in Two Instructional Modalities
5389	Bergeron	Paul	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Assessing Students' Knowledge and Skills with 3 Dimensional Learning
5552	Baker	D. Blane	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Building Critical Thinking Skills in General Education Science Courses
5558	Tagg	Randall	(LA) Integrating Climate, Energy, Sustainability in the Classroom and Beyond, Introductory Cou	Physics for Humans
4591	Torigoe	Eugene	(LB) Introductory Labs/Apparatus	How did they time that? An Investigation of Fall Time
4759	Pawl	Andrew	(LB) Introductory Labs/Apparatus	Claims, Evidence and Reasoning in the Introductory Mechanics Lab
5186	Hopps	Alexandra	(LB) Introductory Labs/Apparatus	Physics labs that resonate with pre-med students
5207	Senanayake	Kavindya	(LB) Introductory Labs/Apparatus	Innovative experiments with inexpensive lab kits for introductory Physics labs
5227	Yu	Guofen (Heather)	(LB) Introductory Labs/Apparatus	What Went Wrong in Mass-Spring Conservation of Energy?
5659	Spalding	Gabriel	(LB) Introductory Labs/Apparatus	Flux Concept Discovery Lab
5155	Vignal	Michael	(LC) PER: Assessment, Grading and Feedback III	Affordances of Articulating Assessment Objectives
5175	Shaw	Ivy	(LC) PER: Assessment, Grading and Feedback III	Impact of Response-Shift Bias on Students' Sense of Relevance
5180	SIRNOORKAR	AMOGH	(LC) PER: Assessment, Grading and Feedback III	Analyzing students' sensemaking with algebraic inequalities
5320	Thacker	Beth	(LC) PER: Assessment, Grading and Feedback III	Development of a Likert-style instrument to assess LA's PCK-Q
5443	Smith	Trevor	(LC) PER: Assessment, Grading and Feedback III	Interpreting Item Response Theory Results Using a Thermodynamic Analogy
5567	Santangelo	Brianna	(LC) PER: Assessment, Grading and Feedback III	Measuring changes in student reasoning: Theoretical framework and methodology*
4718	Nandivada	Lalitasri	(LD) Short Courses and Other Innovations	Gee-Whiz! Encouraging Undergraduate Students to Move towards Experimental Physics
4775	Scott	Tyler	(LD) Short Courses and Other Innovations	A Chapter per Day: An Account of 7.5 Week Sessions
5643	Cannon	Beverly Trina	(LD) Short Courses and Other Innovations	"Short Course" does not translate to "Short Time"
4717	Khodaeifaal	Solmaz	(LE) Quantum Education in the High School Classroom	Well Developed Curriculum and Pedagogy of Quantum Mechanics for Adolescents
4869	Lane	W. Brian	(LE) Quantum Education in the High School Classroom	Integrating Quantum in the IB High School Physics Classroom
5123	Patterson	Zac	(LE) Quantum Education in the High School Classroom	Quantum Physics in Secondary Schools – An Analysis of PER
4620	Chasteen	Stephanie	(LF) Strategies for Teacher Recruitment	What promotes sustainability of PhysTEC-funded physics teacher education programs?
5136	Anderson	Jon	(LF) Strategies for Teacher Recruitment	The Five "W's" of Leading Virtual Workshops
5570	Richards	AJ	(LF) Strategies for Teacher Recruitment	Noyce at a PUI: Outcomes and Sustainability
5306	Carroll	Gregory	(LG) Training Learning Assistants and Graduate Students to be Effective Lab Assistants II	A National Survey of Physics Graduate TA Preparation
5384	Mumford	J. Reid	(LG) Training Learning Assistants and Graduate Students to be Effective Lab Assistants II	Post-Semester Feedback Meetings to Encourage Teaching Growth
5486	Lane	Stephen	(LG) Training Learning Assistants and Graduate Students to be Effective Lab Assistants II	TA training by TAs: attitudes in the undergraduate lab environment
6746	Engblom	Samuel	(LG) Training Learning Assistants and Graduate Students to be Effective Lab Assistants II	How an LA's Prior Student Experience Can Ground their Teaching
5101	Stelzer	Tim	(LH) PER: Student and Instructor Support & Professional Development, Program and Institutio	The Illinois Physics and Secondary Schools Partnership Program
5108	Talafian	Hamideh	(LH) PER: Student and Instructor Support & Professional Development, Program and Institutio	Teachers' Perceptions of a Design Based Research Practice Partnership Program
5557	Mahmood	Maggie	(LH) PER: Student and Instructor Support & Professional Development, Program and Institutio	Physics Teachers Learning in Professional Development Settings: A Case Study
5456	House	Lindsay	Astronomy Posters	Dark Energy Explorers: Using Citizen Science to Enhance the Hobby-Eberly-Telescope-Dark-Energy-Experiment
5553	Clifton	Yeaton	Astronomy Posters	Carbon Dioxide and Astronomy I: Hands on Laboratory.
5555	Clifton	Yeaton Clifton	Astronomy Posters	Carbon Dioxide Hands On Experience 2: Chemical Reasoning
5623	Gugliucci	Nicole	Astronomy Posters	Discovering Solar Flares with High School Students
5704	Lindell	Rebecca	Astronomy Posters	Augmented Reality, Spatial Reasoning, and the Teaching of Lunar phases
5268	Ordaz Mendoza	Belter	General Topics Posters	Hands-on Gauss' Law Activity in Introductory Electricity and Magnetism
5408	Hsu	Leon	General Topics Posters	STEM MILES: Mentoring Innovative Learning Experiences for Students
5419	Amaral	Camila	General Topics Posters	A case Study: Gender Differences in Higher Education Courses
5543	Yang	Yuehai	General Topics Posters	The low-cost student project on "acoustic tweezer"
5585	Pruett	Zachary	General Topics Posters	Outline of a Workshop about Having Interactions Regarding Climate Misinformation
5640	Saucy	Toni	General Topics Posters	Impact of Summer Research in a Small Liberal Arts Setting
5661	Rutberg	Joshua	General Topics Posters	Utility of Differential Models in Algebra-Based Physics
4760	Pawl	Andrew	Labs/Apparatus Posters	Graphing Energy Efficiency in Introductory Physics Labs
5115	Sampere	Sam	Labs/Apparatus Posters	Radiant Cooling in the Student Lab and Beyond
5470	Schnider	Dorotya	Labs/Apparatus Posters	Exoplanet research: Student experimentation in high school
5484	Madden	Keith	Labs/Apparatus Posters	Simple Home-built Laboratory Experiments for Remote Learning
5581	Postiglione	Jake	Labs/Apparatus Posters	Smart Physics: Bouncing from the Board to the Screen
5688	Poveda Correa	Juan Sebastian	Labs/Apparatus Posters	Smart Physics: Flexible and Customizable Physics Experiences
6771	DeStefano	Paul	Labs/Apparatus Posters	Mid-Study Results from an Online, Design-Your-Own Laboratory Experiment Curriculum
5153	Young	Dan	Lecture/Classroom Posters	COVID-Related Introductory Exam Questions and Analysis
5159	Wood	Laura	Lecture/Classroom Posters	Lessons Learned from Embedded Research Course at a Community College
5223	Augustine	Victoria	Lecture/Classroom Posters	Engaging students in energy learning by practicing community decision making
5301	Martinez	Joseph	Lecture/Classroom Posters	Reorganization of Physics Curriculum with a Focus on Student Growth
5366	Massa	Michael	Lecture/Classroom Posters	A Multi-Course Integration of Computation into Our Physics Curriculum
5390	Begeron	Paul	Lecture/Classroom Posters	Using 3 Dimensional Learning to Improve Student Learning on Assessments

5565	Boehlig	Thommy	Lecture/Classroom Posters	Applying the Tactile Reaction Training TReaT in a Physics Classroom
5576	Falconer	Kathleen	Lecture/Classroom Posters	(Naïve) aerodynamic concepts in-class & in-game –Flight Physics Concept Inventory
5727	Hill	Sam	Lecture/Classroom Posters	A Streamlined Approach to the Introductory Physics Textbook
6072	Franklin	Donald	Lecture/Classroom Posters	Physics for the Modern World
4498	Brundage	Mary	Physics Education Research Posters I	Evolution in student conceptual understanding of electricity and magnetism
4499	akambaraswaran	akambaraswaran	Physics Education Research Posters I	gravity
4549	Maries	Alexandru	Physics Education Research Posters I	Evolution in student conceptual understanding of energy and momentum
4550	Maries	Alexandru	Physics Education Research Posters I	Self-efficacy, perceived recognition, interest and identity of physics majors
4554	Cwik	Sonja	Physics Education Research Posters I	Learning environment predicts women's motivational beliefs in introductory physics courses
4561	Chasteen	Stephanie	Physics Education Research Posters I	How do new physics faculty teach? New Faculty Workshop Insights
4566	Li	Yangqiuting	Physics Education Research Posters I	How inclusiveness of learning environment predicts students' physics motivational beliefs
4573	Hu	Peter	Physics Education Research Posters I	Using Clicker Question Sequence to Teach Time-Development in Quantum Mechanics
4578	Zoechling	Sarah	Physics Education Research Posters I	Students' Types of Interest in Physics
4581	Malespina	Alysa	Physics Education Research Posters I	Female students' self-efficacy benefits most from same-gender group work
4582	Malespina	Alysa	Physics Education Research Posters I	Does test anxiety explain gender differences in physics exam scores?
4616	m	akambaraswaran	Physics Education Research Posters I	new theory of earth gravity
4626	Zeng	Liang	Physics Education Research Posters I	(Cancel) A Skateboarding Experiential Learning Activity for Introdu
4632	Justice	Paul	Physics Education Research Posters I	Development clicker questions on addition of angular momentum in QM
4716	Zu	Tianlong	Physics Education Research Posters I	Effect of Guided Retrieval Practice and Feedback on Physics Problem-Solving
4748	Santana	Lisabeth	Physics Education Research Posters I	Negative impacts of an unwelcoming physics environment on undergraduate women
4753	Wheatley	Christopher	Physics Education Research Posters I	Module Analysis of The Brief Electricity and Magnetism Assessment
4823	Hewagallage	Dona	Physics Education Research Posters I	Exploring the factors affecting the expert-like scientific attitudes
5122	Ma	Guofu	Physics Education Research Posters I	Scientific Argumentation in the Secondary Physics Classroom
5127	Amaral	Camila	Physics Education Research Posters I	Qualitative Social Network Analysis of Women and LGBT+ professional physicists
5133	Kushimo	Tunde	Physics Education Research Posters I	Investigating Students' Strengths and Difficulties in Quantum Computing
5141	Dancy	Melissa	Physics Education Research Posters I	White male physicists sense-making around equity in STEM
5151	Wipfli	Kyle	Physics Education Research Posters I	Development of a Likert-style instrument to assess LA's PCK-Q
5177	Johnson	Jordan	Physics Education Research Posters I	Assessing Thinking Skills in Free-response Exam Problems: Covid vs. Non-covid
5202	Johns	Patrick	Physics Education Research Posters I	Exploring the Reliability of Natural Language Processing Models Across Populations
5203	Kustina	Jonathan	Physics Education Research Posters I	Learning to Teach, Teaching to Learn: Peer Coaches and Metacognition
5215	Doucette	Danny	Physics Education Research Posters I	What supports the trajectories of white men in physics?
5222	Crossette	Nate	Physics Education Research Posters I	Social network analysis of student collaboration in pandemic-affected courses
5237	Nissen	Jayson	Physics Education Research Posters I	Socio-metacognitive experiences in a course for future teachers
5248	Khong	Hien	Physics Education Research Posters I	Undergraduates develop their imagined future professional selves
5255	Young	Nicholas	Physics Education Research Posters I	Who answers complex multiple-choice questions in physics correctly?
5257	Sammons	Amber	Physics Education Research Posters I	Comparison of expert-like attitudes and scientific reasoning skills
5313	Omar	Hady	Physics Education Research Posters I	Understanding the impact of the Drew Science Scholars program
5331	Monsalve	Camila	Physics Education Research Posters I	Revolutionary Love help students navigate belonging to a science community?
5350	Myers	Carissa	Physics Education Research Posters I	Investigating Measures of Self-Efficacy Disaggregated by Time
5351	Merino	Christian	Physics Education Research Posters I	How Societal Issues Impact Instructors' Views of DEI
6644	Taylor	Tiffany	Physics Education Research Posters I	Student Learning of Photoelectric Effect Using Simulations and Reflective Writing
5267	Meredith	Dawn	Physics Education Research Posters II	Development of questions for the Fluids Conceptual Evaluation (FCE)
5377	Hansen	John	Physics Education Research Posters II	Curricular Analytics: The Complexity of Off-Sequence Course Progression
5380	Wilcox	Bethany	Physics Education Research Posters II	Developing actionable feedback statements for research-based assessments
5396	Mathis	Clausell	Physics Education Research Posters II	How Instructor's Conceptions of Knowledge Bolster their Culturally Relevant Teaching
5397	Daane	Abigail	Physics Education Research Posters II	Connecting Climate Change to your Energy Unit
5399	Modir	Bahar	Physics Education Research Posters II	Comparison of discussions in different online physics classrooms for educators
5424	Sachmpazidi	Diana	Physics Education Research Posters II	A survey for assessing instructional change teams in undergraduate STEM
5429	Kaufman	Grant	Physics Education Research Posters II	Student attitude changes and curricular benefits from two instructional interventions
5471	Stanley	Bryan	Physics Education Research Posters II	From volunteer to program leader: a career in informal physics
5524	Wagner	DJ	Physics Education Research Posters II	Refining Assessment Questions Based on Clinical Interviews
5540	Laverty	James	Physics Education Research Posters II	Supporting Instructors through Research Based Assessment
5546	Parisi	Elizabeth	Physics Education Research Posters II	Developing a Physics Career Intervention Among Middle School Students
5566	Sawtelle	Vashti	Physics Education Research Posters II	Rejecting the Gendered Boxes of Science
5578	Garcia	Tyler	Physics Education Research Posters II	The Effect of Value-Focused Discussions on Scientists' Ethical Decision Making
5591	Chagdes	Adrianna	Physics Education Research Posters II	Student Perspectives on Social Justice and Equity in STEM
5601	Zamarripa Roman	Brian	Physics Education Research Posters II	Nuanced explorations of personal support networks: a cross-case analysis
5606	Falconer	Kathleen	Physics Education Research Posters II	The unfolding roles of mentors and tutors in Learning-by-Teaching model
5607	Waterson	Alyssa	Physics Education Research Posters II	Operationalizing Academic Integration for Post-Transfer Students: Discussing Quantitative Factors
5614	Dalka	Robert	Physics Education Research Posters II	Growing as a change agent: Slowing down and facilitating teams
5616	Dalka	Robert	Physics Education Research Posters II	Students' roles in faculty-student partnerships
5619	Dalka	Robert	Physics Education Research Posters II	Network analysis of Likert-style surveys
5633	Meyer	Josephine	Physics Education Research Posters II	Investigating student interpretations of differences between classical and quantum computers
5635	Pace	John	Physics Education Research Posters II	Machine Learning Techniques for Classifying Physics Performance

5639	Bridges	Bill	Physics Education Research Posters II	Identifying Epistemic Frames in Faculty Discourse Centered around Ethics
5644	Lindell	Rebecca	Physics Education Research Posters II	The Advantages and Disadvantages of Virtual Qualitative Interviewing
5655	Rodgers	Jake	Physics Education Research Posters II	Understanding physics identity in computationally integrated physics classrooms.
5658	Swirtz	Madison	Physics Education Research Posters II	Queering methodologies in physics education research
5665	Wooley	Andrea	Physics Education Research Posters II	Addressing Subjectivity in Physics for Equity in Physics Education
5670	Euler	Elias	Physics Education Research Posters II	Students' experience of small and large spatial scales
5673	Bedi	Akash	Physics Education Research Posters II	(Cancel) Changing mindset around computation in a computationally integrated physics
5677	McKagan	Sarah	Physics Education Research Posters II	Using the PhysPort Data Explorer to analyze research-based assessment results
5683	Hinrichs	Brant	Physics Education Research Posters II	Changing Notation That Represents Force Changes How Students Say It
5684	Stump	Tyler	Physics Education Research Posters II	Relating Computational Thinking Practices and Problem Design Features
5685	hinrichs	brant	Physics Education Research Posters II	Shared Resources in Student Problem-Solving of Spherical Unit Vectors
5687	hinrichs	brant	Physics Education Research Posters II	Two contentious board meetings; social positioningCorrelates with consensus building
5702	Mack	Lillianna	Physics Education Research Posters II	Evaluating Patterns Across Educators in their Reflection of Computational Thinking
5713	Schwartz	Megan	Physics Education Research Posters II	Nevertheless, She Persisted: The Impact of Persistence in Computation Education
4817	German	Molly	Pre-college/Informal and Outreach Posters	Place-based education in high school physical science
5364	Stanfield	Clay	Pre-college/Informal and Outreach Posters	Sustaining the Teacher-in-Residence Role
5618	Gipson	Karen	Pre-college/Informal and Outreach Posters	Roger That! A Celebration of Space Exploration (and Collaboration)
5187	Smith	Thaddeus	SPS Undergraduate Posters	Modeling the Omicron Wave of COVID-19 with the SIR Model
5188	Warner	Fiona	SPS Undergraduate Posters	Creating Motion and Forces Content in an Exploratory Computer Game
5462	Sternberg	Zoe	SPS Undergraduate Posters	Personal Neutron Dosimeter Measuring Cosmic Rays in Stratospheric Ballooning Missions.
5612	Chapman	Hannah	SPS Undergraduate Posters	Defining Adaptive Free Choice in a Conscious System
4731	Williams	Jeffrey	Teacher Training/Enhancement Posters	BSU's Advanced Physics Academy: Combining Recruitment with Early Teaching Experiences
4779	Williams	Jeffrey	Teacher Training/Enhancement Posters	An Advanced Physics Academy: Combining Early Teaching Experiences with Recruitment
5138	Garrett	Carlee	Teacher Training/Enhancement Posters	Further development of out-of-field high school teacher preparation
5167	Anderson	Jon	Teacher Training/Enhancement Posters	KITP Teachers' Conference: an Opportunity at the Frontiers of Science
5224	Bishop	Bryn	Teacher Training/Enhancement Posters	Professional Development for K-12 Teachers New to Physics Labs
5547	Kozminski	Joseph	Teacher Training/Enhancement Posters	New Recruitment Strategies for Lewis University's Physics Teacher Preparation Program
5548	Clifton	Yeaton	Teacher Training/Enhancement Posters	Using Critical Discourse Analysis—With Situational Logic to Reach Diverse Groups
5666	Lock	Robynne	Teacher Training/Enhancement Posters	Reimagining graduate physics: Electricity and Magnetism for Educators
4712	Vieyra	Rebecca	Technologies Posters	LiDAR Motion Ranger on your iPhone to Teach Kinematics Graphs
4840	Wang	Yu	Technologies Posters	PhysicsCHOPS - A Platform for Remote Collaborative Problem Solving
5303	Countryman	Colleen	Technologies Posters	Creating an Interactive Simulation for Non-Inertial Reference Frames
5571	dumitriu	ileana	Technologies Posters	REMOTE SENSING AND HARMFUL ALGAL BLOOMS IN THE FINGER LAKES
5706	McColgan	Michele	Technologies Posters	Augmented Reality to Teach Magnetism Concepts
5716	Valente	Diego	Technologies Posters	Cross-Platform Interactive Simulations for Introductory Physics
5728	Hill	Sam	Technologies Posters	Replacing the LMS as an ADHD Professor and Web Developer
4633	Justice	Paul	Upper Division and Graduate Posters	Developing clicker questions on Larmor precession of spin in QM
5114	Agyare	Benjamin	Upper Division and Graduate Posters	Critical Energy Required for Intrinsically Localized Vibrations in NaI
5695	Wiegert	Craig	Upper Division and Graduate Posters	Exploring Chaos by Creating Simulations of Nonlinear Systems