Thank you for joining us today
April 10, 2021

Virtual Spring Meeting

Connecting Teachers in a Physically-Distant World

Hosted by
Mariana Lazarova (University of Northern Colorado),
Zachary Armstrong & Taylor Plantt (Greeley West High School)

www.cowyaapt.org/spring2021
Land Acknowledgement

The University of Northern Colorado occupies the lands in the territories of the Ute, Cheyenne, and Arapaho peoples. The University acknowledges the 48 tribes that are historically tied to the state of Colorado. Thus, the land on which UNC is situated is tied to the history and culture of our native and indigenous peoples. UNC appreciates this connection and has great respect for this land. Additionally, the University community pays its respect to Elders, past, present, and future, and to those who have stewarded this land throughout the generations.
Schedule & Logistics

available online: [http://www.cowyaapt.org/spring2021/](http://www.cowyaapt.org/spring2021/)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>Welcome &amp; Logistics</td>
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<tr>
<td>8:40</td>
<td>Discussion forum: Virtual Meet &amp; Greet</td>
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<tr>
<td>9:00</td>
<td>Invited workshop: Mindfulness &amp; Empathy in the Science Classroom (Nadene Klein)</td>
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<td>9:50</td>
<td>Break (5 min)</td>
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<td>9:55</td>
<td>Contributed workshop: #LeadershipGoals (Nicole Schrode &amp; Shannon Wachowski)</td>
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<tr>
<td>10:25</td>
<td>Business meeting</td>
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<tr>
<td>10:55</td>
<td>Break (5 min)</td>
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<tr>
<td>11:00</td>
<td>Contributed talk: A Question of Modalities (Suzanne Taylor)</td>
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<tr>
<td>11:15</td>
<td>Invited workshop: STeLLA: Science Teacher Learning from Lesson Analysis (Connie Hvidsten)</td>
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<td>12:05</td>
<td>Lunch break</td>
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<tr>
<td>12:50</td>
<td>Discussion forum: What the heck is that? (Courtney Willis)</td>
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<td>1:00</td>
<td>Contributed talk: Raising the Bar in an Alternative Setting (Nadene Klein)</td>
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<td>1:15</td>
<td>Contributed short talk: Exploring the Details of Rainbow Formation with GeoGebra (David Chandler)</td>
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<td>1:20</td>
<td>Contributed short talk: Sensor Cart Physics (Roger Larson)</td>
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<tr>
<td>1:25</td>
<td>Contributed short talk: Where do heavy R-process elements come from? (Caroline Leach)</td>
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<tr>
<td>1:30</td>
<td>Invited talk: Galactic black holes &amp; the 2020 Nobel Prize in Physics (Mariana Lazarova)</td>
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<td>1:55</td>
<td>Break (5 min)</td>
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<td>2:00</td>
<td>Contributed workshop: Teaching Waves with PEER Physics Open Source Resources for General Physics (Emily Quinty &amp; Shelly Belleau)</td>
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<td>2:45</td>
<td>Break (5 min)</td>
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<td>2:50</td>
<td>Invited talk: Effective traditional and virtual education outreach (Brian Jones)</td>
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<td>3:40</td>
<td>Break (5 min)</td>
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<td>3:45</td>
<td>Discussion forum: DIY @ Home Demo Show &amp; Competition (Mariana Lazarova)</td>
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<td>4:15</td>
<td>PRIZE drawing &amp; Farewell</td>
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Nadene Klein

a science teacher from DC Oaks High Schools, will lead a workshop on incorporating Mindfulness and Empathy Practices in the Secondary Science Classroom. For some students, science is a high stress class, especially when math is involved. It can be for the teacher too. This workshop will share some strategies to use mindfulness and elicit empathy from students that can be interwoven in the science classroom. The goal is to help reduce stress and refocus your class.

Dr. Connie Hvidsten

a science educator from BSCS, will introduce STeLLA: Science Teachers Learning from Lesson Analysis. In this session, we will explore the power of video analysis to improve teachers' understanding of strategies that deepen student understanding and critical reasoning. The STeLLA program has been researched for more than 15 years and been shown to improve both teaching practice and student learning. Participants will be introduced to a library of video resources that can be used by school science departments, school coaches, district PD providers, universities and others involved in improving physics instruction.

Brian Jones

director of the Little shop of Physics and Colorado State University physics instructor, will share insights about effective traditional and virtual education outreach.

Dr. Mariana Lazarova

an assistant professor at the University of Northern Colorado, will shed some light on galactic supermassive black holes (they are black holes, so I hope you don’t expect any light coming back!) and the 2020 Nobel prize in Physics, particularly highlighting Dr. Andrea Ghez – only the fourth woman to win the prize – and her work on the black hole in the center of the Milky Way.
CO/WY AAPT Virtual Spring Meeting

Meet & Greet

8:40 - 9:00 AM
breakout rooms
Meet & Greet
Join a breakout room of your choice
Invited workshop

Mindfulness & Empathy in the Science Classroom

Nadene Klein (Daniel C. Oakes High School)

9:00am- 9:50am

Mariana’s recommended resource on the topic:

Teaching with Compassion

An Educator’s Oath to Teach from the Heart

Peter Kaufman and Janine Schipper
Short Break (5 min)

Next... 9:55am #LeadershipGoals workshop
Contributed workshop

#LeadershipGoals

Nicole Shrode (SVVSD and PEER Physics) & Shannon Wachowski (Science & CTE Consultant at the Wyoming Department of Education and PEER Physics)

Next... 10:25am

Business meeting
Business Meeting

Samantha Ogden (President of CO/WY AAPT)

President:
- Samantha Ogden, University of Wyoming (term: 2019-2021)

President-Elect:
- Jasmine Andersen, University of Denver, (term: 2019-2021)

Vice Presidents:
- Mariana Lazarova, University of Northern Colorado (term: 2019-2021)
- Zach Armstrong & Taylor Plantt, Greeley West High School (term: 2019-2021)

Secretary/Treasurer:
- Grant Denn, Metropolitan State University, Denver (term: 2019-2021)

Section Representative:
- Vince Kuo, Colorado School of Mines (term: 2018-2021)

Past President:
- Grant Denn, Metropolitan State University, Denver (term: 2019-2021)

Webmaster:
- Adam Pearlstein, Little Shop of Physics, Colorado State University (term: 2019-2021)

Members-at-Large:
- Matt Leach, Douglass County High School (term: 2019-2021)
- Paul Marquard, Casper College (term: 2019-2021)
- Zach Armstrong, Greeley West High School (term: 2018-2021)

10:25 am-10:55 am
Short Break (5 min)

Next... 11:00am  Contributed Presentations
Contributed presentation

A Question of Modalities

Suzanne Taylor (Western Colorado University)

11:00-11:15am
Invited workshop

STeLLA workshop: Science Teachers Learning from Lessons Analysis

Dr. Connie Hvidsten (BSCS, Colorado Springs)

11:15-12:05pm
Lunch Break (45 min)

Next... 12:50pm

What the heck is that?
What the heck is that?

Dr. Courtney Willis (Emeritus Professor, UNC)

**Helmholtz Resonators:**
How did we used to identify specific sound frequencies

**Inertial balance:**
What is inertial mass & how do astronauts measure their mass when they are weightless

**Vacuum tubes:**
What are they & what do they have to do with radio waves

**Slide Rule:**
What is it & how to use it

**Thornton apparatus:**
What is this physics equipment at the back of your lab storage & how to use it

12:50pm-1:00pm
Contributed presentations

Raising the Bar in an Alternative Setting
Nadene Klein (Daniel C. Oakes High School)

1:00pm-1:15pm
Contributed short talks

“Exploring the details of rainbow formation using GeoGebra”
   David Chandler (Retired, Math Without Borders)

“Sensor Cart Physics”
   Roger Larson

“Where do heavy r-process elements come from?”
   Caroline Leach (University of Denver)

1:00pm-1:15pm
GWR & Heavy Elements

Where do R-process Elements come from?

Caroline Leach
Advisor: Dr. R. Stencel
Undergraduate Physics Student | University of Denver
Invited talk

Galactic Black Holes & the 2020 Nobel Prize in Physics

Dr. Mariana Lazarova (University of Northern Colorado)

1:30 pm-1:55pm
Short Break (5 min)

Next... 2:00pm

PEER Physics workshop
Contributed workshop
Teaching Waves with PEER Physics Open Source Resources for General Physics

Emily Quinty & Shelly Belleau (PEER Physics, CU Boulder)
Short Break (5 min)

Next... 2:55pm

Effective Outreach
Invited talk

Effective traditional and virtual education outreach

Brian Jones (Colorado State University)

2:50pm-3:40pm
Short Break (5 min)

Next... 2:55pm  Demo show & Competition
Demo show – DIY @ home

Next... 4:10pm

Demo Competition
Demos Competition

Diffraction from Post-It notes
  Conner Leftwich (CSU)
Pressure in a bottle with balloon
  Brenna Sydow (CSU)
Rubens’ tube
  Adam Perlstein (CSU)
Scattering of light
  Mariana Lazarova (UNC)
Brenna Sydow (CSU)
Thank you for being part of it

www.cowyaapt.org/spring2021

And the winner is....

Prize drawing:
• best demo
• attendance