

**2022 FOUR CORNERS MEETING OF THE
AMERICAN PHYSICAL SOCIETY**

BULLETIN

OF THE FOUR CORNERS SECTION OF THE AMERICAN PHYSICAL SOCIETY

UNIVERSITY OF NEW MEXICO

2022

October 14-15, 2022

Albuquerque, NM

General Information

Welcome to the University of New Mexico!

We are pleased to have you join us for the 2022 meeting of the Four Corners Section of the American Physical Society. In April 1998, the inaugural meeting of the Four Corners Section was held at UNM in the underground classrooms of *Regener Hall*. This year, the 25th sectional meeting returns to UNM. The meeting will be held in *PAÍS*, the new *Physics and Astronomy and Interdisciplinary Sciences* building. The program consists of a 7 Plenary lectures in three sessions, with topics spanning lightning, materials physics, exoplanets, quantum computing, biological physics, atomic physics, and black holes, respectively. The Lustig Award Session is a competition between 3 graduate student speakers for a \$1000 cash prize. Between these events are Parallel sessions featuring 13 invited and 135 contributed talks. The program begins at 8:15 am on Friday the 14th, and ends after the awards ceremony at 4:45 pm on Saturday the 15th. Nearly 50 posters will be on display at the Friday afternoon poster session. The Banquet on Friday evening will feature the keynote lecture on the James Webb Space Telescope.

Receptions: There will be two light breakfasts, beginning at 7:15 am on both Friday and Saturday mornings. Coffee breaks will be on Friday at 9:30 am and 2:00 pm, and Saturday at 10:15 am and 2:45 pm.

Banquet: Conference registration includes the banquet, which will take place on Friday evening at 6:00 pm in ballroom C of the UNM Student Union Building (SUB). Because the number of dinners must be ordered in advance, we can only guarantee your seat if you registered for the conference by October 4th deadline. The after-dinner speaker will be **Sarah Kendrew** of the European Space Agency and the Space Telescope Institute, speaking on *Highlights from James Webb Space Telescope Commissioning and Early Science*. The talk will begin at approximately 7:30 pm. It is open to all conference attendees, and will also be accessible by zoom.

Plenary Lectures: At 8:30 am on Friday morning, **Richard Sonnenfeld** will speak on *Lightning Interferometry and Wind Energy*, followed by **Sergei Tretiak** speaking on *Machine Learning for Chemical Properties and Materials*.

At the 2:30 pm plenary session on Friday afternoon, **Diana Dragomir's** title is *Oh, the things we've seen! An unexpected journey through NASA's TESS mission*, while **Andrew Landahl** will explain how *Quantum computing is a wayfinder for frontier physics*.

The final plenary session on Saturday afternoon at 3:15 pm will feature three speakers. First, **Keith Lidke** will speak on *Circumventing the diffraction limit to observe nanoscale protein interactions*. **Dylan Yost** will follow, speaking on *Precision measurement and control of atomic hydrogen*. The final talk of the conference will be delivered by **Maria Rodriguez**, on "Black holes; the invisible secrets to our universe".

Lustig Award Session: On Saturday morning beginning at 10:45 am, three graduate student finalists will deliver talks as part of a competition for the \$1000 Lustig Award. They are **Mallory Harris** (Univ. New Mexico), **Gurjyot Sethi** (Univ. Utah), and **Yaroslav Balytsky** (Univ. Colorado Colorado Springs) .

Parallel Sessions: There are 18 parallel sessions, divided by subject matter, with 135 contributed talks that will showcase a variety of research in the four corners. Invited speakers will lead off in 13 of the 18 sessions.

Posters: Poster presenters are invited to set up their posters at the beginning of the conference, and to leave them displayed throughout. The posters will be put up on the glass panes surrounding the 2nd floor Mezzanine area in PAÍS. The formal poster-presentation period will be from 4:00 – 6:00 pm on Friday afternoon.

APS Student Awards: Approximately ten \$100 awards will be given for outstanding undergraduate and graduate student presentations. If you are a student giving an oral or poster presentation, be sure to notify your session chair. All student presentations will be considered for awards. The results of the competition will be announced at the 4:45 pm Saturday afternoon awards session.

SPS Zone Meeting: On Friday at 11:45 am the Society of Physics Students will be meeting in the PAÍS courtyard and going to lunch together.

Parking: You will have to pay to park on campus on Friday October 14th. There are some self-service pay stations along Redondo Dr. in front of PAÍS, and 500 feet to the west of PAÍS. Your most convenient option may be to park in the *Cornell parking structure*. The entrance to this parking garage is located on Redondo Dr., 300 feet to the east of PAÍS.

On Saturdays, parking on campus is open to the public in any zoned parking lot (A-lot, B-lot, etc.) The large A-lot, about 500 feet to the east of PAÍS along Redondo Dr. may be the most convenient. Parking is not permitted in designated reserved spaces, and there is still a charge on Saturday for metered parking, parking in designated pay-station areas, and for parking garages.

Restaurants: Across Central Ave, south of PAÍS, are many fast- and slow- food restaurants that should be a suitable option for the lunch breaks on Friday and Saturday.

Schedule of Events
Friday, 14 October 2022

7:15 am

Light Breakfast and Poster Setup: PAÍS Lobby

8:15 am

A00. Conference Opening (Welcome): **Arash Mafi**, Dean, UNM College of Arts and Sciences. PAÍS 1100.

8:30 am

A01. Plenary I: **Richard Sonnenfeld**, *Lightning Interferometry and Wind Energy*; **Sergei Tretiak**, *Machine Learning for Chemical Properties and Materials*. PAÍS 1100.
(<https://unm.zoom.us/j/92669203107?pwd=cTZ1MWx3cVZzQ1dJVi8rdFNnSUxyQT09>)

9:30 am

Coffee Break: PAÍS Lobby.

10:00 am

B01. Plasma Physics and Condensed Matter I: **Michael Litos**. PAÍS 1010. Chair: Paul Schwoebel

B02. Gravitation / Cosmology I: **Francis-Yan Cyr-Racine**. PAÍS 1140. Chair: Rouzbeh Allahverdi

B03. Atomic, Molecular, and Optical Physics I: **Tara Drake**. PAÍS 1100. Chair: Elohim Becerra

B04. Astrophysics I: **Natalie Gosnell**. PAÍS 1160. Chair: Denise Stephens

B05. Biophysics and Soft Condensed Matter I: PAÍS 2540. Chair: Tonmoy Chakraborty

11:45 am

Lunch Break

1:00 pm

D01. Plenary II: **Diana Dragomir**, *Oh, the things we've seen! An unexpected journey through NASA's TESS mission*; **Andrew Landahl**, *Quantum computing is a wayfinder for frontier physics*. PAÍS 1100.
(<https://unm.zoom.us/j/95782044459?pwd=SGhtUXhwdVBGK3ZzWEZKOG9MeVA4dz09>).

2:00 pm

Coffee Break: PAÍS Lobby.

2:30 pm

E01. Nuclear/Particle Physics I: **Michael Paolone**. PAÍS 1100. Chair: Dinesh Loomba

E02. Quantum Information I: **Meenakshi Singh**. PAÍS 1010. Chair: Ivan Deutsch

E03. Condensed Matter Physics II: **Eric Montoya**. PAÍS 2540. Chair: Victor Acosta

E04. Astrophysics II: **Denise Stephens**. PAÍS 1160. Chair: Greg Taylor

E05. Materials I: **Arunima Singh**. PAÍS 1140. Chair: Heinz Nakotte

4:06 pm

F01. Poster Session: PAÍS, 2nd Floor Mezzanine.

6:00 pm

G00. Banquet: **Sarah Kendrew** of the European Space Agency and the Space Telescope Institute, *Highlights from James Webb Space Telescope Commissioning and Early Science*. UNM Student Union, Ballroom C.

(<https://unm.zoom.us/j/97258686738?pwd=Mlo3QWJVVStjWEIyeXVRZ3dTM1lYQT09>)

Saturday, 15 October 2022

7:15 am

Light Breakfast: PAÍS Lobby.

8:30 am

J01. Nuclear/Particle Physics II: PAÍS 1100. Chair: Douglas Fields

J03. Atomic, Molecular, and Optical Physics II: PAÍS 1160. Chair: Dylan Yost

J04. Physics Education and Quantum Info II: **Bethany Wilcox**. PAÍS 1140. Chair: Wolfgang Rudolph

J05. Biophysics and Soft Condensed Matter II: PAÍS 2540. Chair: Keith Lidke

10:15 am

Coffee Break: PAÍS Lobby.

10:45 am

K01. Lustig Award Session: Mallory Harris, Gurjyot Sethi, and Yaroslav Balytsky. Room 1100, PAÍS. (<https://unm.zoom.us/j/99738049846?pwd=dUdPUEdkVGNoUjlaMIN4WHJBMXNIUT09>)

11:45 am

Lunch Break

1:00 pm

M01. Nuclear/Particle Physics III: PAÍS 1100. Chair: Michael Paolone

M02. Gravitation / Cosmology II: PAÍS 1160. Chair: Dinesh Loomba

M04. Atmospheric Physics/Geophysics: **Mousumi Roy**. PAÍS 2540. Chair: Richard Sonnenfeld

M05. Materials II: **John Gibbs**. PAÍS 1140. Chair: Eric Montoya

2:45 pm

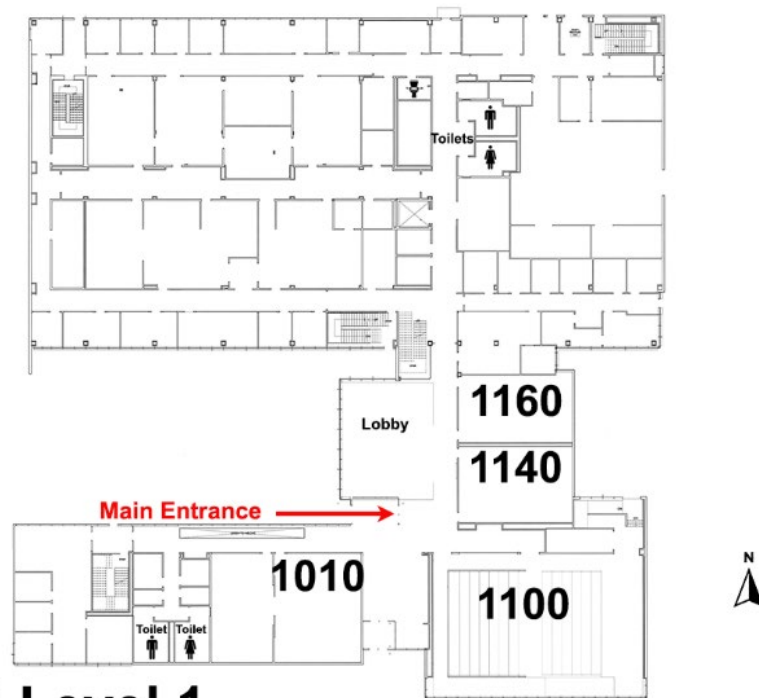
Coffee Break: PAÍS Lobby.

3:15 pm

N01. Plenary III: Keith Lidke, *Circumventing the diffraction limit to observe nanoscale protein interactions*; Dylan Yost, *Precision measurement and control of atomic hydrogen*; Maria Rodriguez, “Black holes; the invisible secrets to our universe”. Room 1100, PAÍS. (<https://unm.zoom.us/j/95183203656?pwd=aWQybklrRGNoaEFmVUZOSDRWeDdlQT09>)

4:45 pm

P01. Awards & Section Business: Room 1100, PAÍS.



PAÍS Level 1



PAÍS Level 2

Walking Route from PAÍS to Student Union (SUB Ballroom C location for Friday's 6:00 pm banquet)

