TIGER - The Inaugural Workshop of Exploring the Frontiers of Nuclear, Particle, and Astrophysics

Report of Contributions

https://indico.bnl.gov/e/26701

Contribution ID: **1** Type: **not specified**

Beyond the Equations, The Universe Round Table

Thursday 10 April 2025 15:20 (40 minutes)

This podcast is designed to complement our two-day workshop, where experts from astronomy, nuclear physics, and particle physics collaborate to narrate the fascinating story of our universe. Through in-depth discussions on topics such as the Big Bang, particle creation, galaxy formation, and cosmic discoveries, students will gain a preview of what to expect from the workshop and a thoughtful summary of key insights afterward.

Presenter: Dr (MAGDY) ABDELRAHMAN, Niseem (Texas Southern University)

Contribution ID: **2** Type: **not specified**

The Universe Primordial Soups

Wednesday 9 April 2025 11:20 (40 minutes)

Presenter: Dr (MAGDY) ABDELRAHMAN, Niseem (Texas Southern University)

Contribution ID: **3** Type: **not specified**

Nuclear Physics Research at BNL

Wednesday 9 April 2025 09:40 (40 minutes)

Presenter: Dr CHIU, Mickey (Brookhaven National Lab)

Contribution ID: **4** Type: **not specified**

Nuclear Data & Applied Nuclear Science at the National Nuclear Data Center

Wednesday 9 April 2025 10:40 (40 minutes)

Presenter: CHIMANSKI, Emanuel (BNL)

Contribution ID: **5** Type: **not specified**

Introduction to particle physics & applications

Wednesday 9 April 2025 14:00 (40 minutes)

Presenter: ASSAMAGAN, Ketevi Adikle (BNL)

Contribution ID: **6** Type: **not specified**

Physics and computing with ATLAS and US-ATLAS

Wednesday 9 April 2025 14:40 (40 minutes)

Presenter: ONYISI, Peter (U. Texas Austin)

Contribution ID: **7** Type: **not specified**

ATLAS inner Tracker Upgrade

Wednesday 9 April 2025 15:45 (40 minutes)

Presenter: LAASSIRI, Mounia (BNL)

Contribution ID: **8** Type: **not specified**

Discussion on Nuclear and Particle Physics & Applications

Wednesday 9 April 2025 16:25 (45 minutes)

Presenters: ASSAMAGAN, Ketevi Adikle (BNL); Dr CHIU, Mickey (Brookhaven National Lab); LAASSIRI, Mounia (BNL); Dr (MAGDY) ABDELRAHMAN, Niseem (Texas Southern University); ONYISI, Peter (U. Texas Austin)

Contribution ID: **9** Type: **not specified**

TSU Administrators Welcome

Wednesday 9 April 2025 09:00 (20 minutes)

Contribution ID: **10** Type: **not specified**

BNL Science Overview

Wednesday 9 April 2025 09:20 (20 minutes)

Contribution ID: **15** Type: **not specified**

TSU COSET Seminar ”Programmable quantum matter at ultracold temperatures”

Wednesday 9 April 2025 12:00 (1 hour)

https://coset.tsu.edu/research-seminar-23/

April 9, 2025
Location: SB 145
Time: 12:00 pm
Presenter: Kaden Hazzard
Programmable quantum matter at ultracold temperatures
Abstract:
Physicists are using highly controllable quantum systems of ultracold atoms and molecules to explore quantum states of unprecedented complexity. I will discuss our theory work and collaborations with experimentalists to control and understand these systems both in real space and in “synthetic dimensions.”We use atoms in laser-sculpted potential landscapes to study strongly correlated fermions, whose behavior is key to understanding major mysteries in real materials, such as the nature of high-temperature superconductors. Further controlling the internal degrees of freedom —for example molecules’rotational states —allows one to create “synthetic dimensions,” in which rotational states act analogously to lattice sites in new spatial dimension and microwave radiation drives transitions between these sites, analogous to tunneling. I will discuss the resulting exotic behaviors as well as experiments probing them, from fluctuating quantum strings to paraparticles —a type of particle beyond the conventional bosons and fermions that was thought impossible until recently.
Prof. Hazzard is a theoretical physicists at Rice University studying the properties of interacting quantum matter. He is interested in fundamentally novel emergent properties, such as new phases of matter and types of nonequilibrium dynamics, as well as how to harness these systems for applications in quantum computation and sensing. He obtained his BS from The Ohio State University, his PhD from Cornell, and was a postdoctoral fellow at the University of Colorado and NIST from 2010-2014, and then started his faculty position at Rice in 2014. He was elected as an American Physical Society Fellow in 2023.

Contribution ID: **20** Type: **not specified**

Environmental, Biological, and Nuclear Physics Research at TSU: A Brief Overview

Thursday 10 April 2025 09:00 (15 minutes)

Presenter: Prof. C. HARVEY, Mark (Texas Southern University)

Contribution ID: **21** Type: **not specified**

From the Early Universe to Machine Learning: A Brief Overview

Thursday 10 April 2025 09:15 (15 minutes)

Presenter: Prof. VRINCEANU, Daniel (Texas Southern University)

Contribution ID: **22** Type: **not specified**

Application of Control Theory Methods to Quantum Edge Dislocation Problems

Thursday 10 April 2025 09:30 (15 minutes)

Presenter: Prof. HANDY, Carlos (Texas Southern University)

Contribution ID: **23** Type: **not specified**

Physics Opportunities with DUNE

Thursday 10 April 2025 11:30 (40 minutes)

Presenter: Dr KALRA, Daisy (Columbia University)

Contribution ID: **24** Type: **not specified**

An intro to neutrino physics and the BNL Neutrino program

Thursday 10 April 2025 09:45 (40 minutes)

Presenter: CARNEIRO, Mateus (BNL)

Contribution ID: **25** Type: **not specified**

DUNE experiment physics and computing

Thursday 10 April 2025 10:50 (40 minutes)

Presenter: HIGUERA PICHARDO, Aaron (faculty@rice.edu;member@rice.edu)

Contribution ID: **26** Type: **not specified**

MASERs: From Protostars to Blackholes

Thursday 10 April 2025 14:00 (40 minutes)

Presenter: Prof. MIGENES, Victor (Texas Southern University)

Contribution ID: **27** Type: **not specified**

Simulating the Early Universe

Thursday 10 April 2025 14:40 (40 minutes)

Presenter: Prof. GARRISON, David

Contribution ID: **28** Type: **not specified**

Closing Remarks

Thursday 10 April 2025 16:00 (10 minutes)