



Understanding the Most Energetic Cosmic Accelerators: Advances in Theory and Simulation

October 28-30, 2020

Virtual Conference via Zoom

Program Organizers

Alex Chen
Patrick Crumley
Maria Petropoulou
Anatoly Spitkovsky

Understanding the Most Energetic Cosmic Accelerators

Wednesday, October 28, 2020—Morning Session

10:25-10:30 *Zoom Log-in and Welcome/Introductions*

Cosmic Rays

10:30-10:50 am

Moderator: Anatoly Spitkovsky

Particle acceleration in galaxy clusters and large scale structure

Gianfranco Brunetti

10:50-11:10 am

Cosmic Rays in Galaxies: Observational Signatures of Acceleration and Transport

Christoph Pfrommer

11:10-11:30 am

Future prospects for understanding the astrophysical energy extreme

Angela Olinto

11:30-11:50 am

Source of the highest energy Galactic Cosmic Rays

Glennys Farrar

11:50 am -12:10 pm

Transport of Ultrahigh-energy Cosmic Rays in Cosmic Environments

Ke Fang

12:10-12:30 pm

Cosmic-ray transport near sources revisited

Brian Reville

12:30- 12:50 pm

Understanding ultra-high energy cosmic ray anisotropies

Noemie Globus

Wednesday, October 28, 2020—Afternoon Session

1:25-1:30 *Zoom Log in*

Pulsars & PWNe

1:30-1:50 pm

Moderator: Alex Chen

Electron acceleration in the Crab Nebula

Gwenael Giacinti

1:50-2:10 pm

Particle acceleration in black hole and neutron star magnetospheres

Alexander Philippov

2:10-2:30 pm

On the role of polar cap pair cascades in the pulsar phenomenon

Andrey Timokhin

2:30-2:50 pm

Pulsar High-energy Emission: From Fermi and NICER data to PIC Models

Constantinos Kalapotharakos

2:50-3:10 pm

Proton acceleration in pulsar magnetospheres

Claire Guepin

3:10-3:30 pm

Alfven wave breakout and the fast radio bursts from the Galactic magnetar

Yajie Yuan

Understanding the Most Energetic Cosmic Accelerators

Thursday, October 29, 2020—Morning Session

10:25-10:30

Zoom Log-in

Reconnection

10:30-10:50 am

Moderator: Vladimir Zhdankin

Particle acceleration in explosive reconnection

Maxim Lyutikov

10:50-11:10 am

Relativistic Nonthermal Particle Acceleration in Collisionless Magnetic Reconnection

Dmitri Uzdensky

11:10-11:30 am

Relativistic reconnection near accreting black holes

Lorenzo Sironi

11:30-11:50 am

Determining the Dominant Acceleration Mechanism during Relativistic Magnetic Reconnection.

Fan Guo

12:00-1:15 pm

Physics Colloquium -- "Explosive Neutron Stars"

Andrei Beloborodov

Thursday, October 29, 2020—Afternoon Session

1:55-2:00

Zoom Log-in

Cosmic Rays & Shock

Moderator: Patrick Crumley

2:00-2:20 pm

The TeV Cosmic Ray Bump: a Message from Epsilon Indi Star?

Mikhail Malkov

2:20-2:40 pm

A new flavor of diffusive shock acceleration

Damiano Caprioli

2:40-3:00 pm

Particle-In-Cell simulations of Synchrotron Maser emission by Relativistic Shocks & implications for FRB models

Illya Plotnikov

3:00-3:20 pm

Electron Heating in Particle-in-Cell Simulations of Perpendicular Shocks

Aaron Tran

3:20-3:40 pm

Electron heating in high Mach number collisionless shock

Vassilis Tsiolis

Understanding the Most Energetic Cosmic Accelerators

Friday, October 30, 2020 – Morning Session

10:25-10:30

Zoom Log-in

Jets

Moderator: Yajie Yuan

10:30-10:50 am

Neutron Star mergers: gravitational waves and jet structure
Dimitrios Giannios

10:50-11:10 am

The importance of plasma instabilities in radiation mediated shocks
Amir Levinson

11:10-11:30 am

Acceleration of non-thermal particles by the helical kink instability
Jonathan Zrake

11:30-11:50 am

Relativistic turbulence in AGN jets
Emanuele Sobacchi

11:50 am-12:10 pm

Pair discharges in Kerr black hole magnetospheres
Benjamin Crinquand

Friday, October 30, 2020 – Afternoon Session

1:25-1:30 pm

Zoom Log-in

Turbulence & Reconnection

Moderator: Kyle Parfrey

1:30-1:50 pm

Nonthermal particle acceleration and radiation in relativistic turbulence
Vladimir Zhdankin

1:50-2:10 pm

Particle acceleration in magnetically-dominated turbulence
Luca Comisso

2:10-2:30 pm

Magnetic reconnection and nonthermal particle acceleration in 3D
Greg Werner

2:30-2:50 pm

Exploring the acceleration mechanisms for particle injection and power-law formation during trans-relativistic magnetic reconnection
Patrick Kilian

2:50-3:10 pm

Secondary particle energization in the relativistic magnetic reconnection
Hayk Hakobyan

Princeton Center for Theoretical Science

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