

Science Program for the 2021 NHFP Science Symposium

(all times are in EDT)

Monday, October 25

- 12:00 **Welcome** — Ken Sembach (STScI)
12:15 **Opening Remarks** — Paul Hertz (NASA)
12:30 **Introduction** — NHFP Leads (various)

Exoplanets 1 (Chair: Megan Mansfield)

- 1:00 **Ferrocyanide survival under long wave (300-400 nm) ultraviolet irradiation on the early Earth** — Zoe Todd (IAS)
1:15 **Ice inheritance in dynamical disk models** — Jennifer Bergner (U. Chicago)
1:30 **Imaging Habitable-Zone Exoplanets Around Nearby Stars** — Kevin Wagner (U. Arizona)
1:45 **The context of planet formation: Mapping the complex environments of protoplanetary disks** — Jane Huang (U. Michigan)
2:00 **Obliquity Constraints on the Planetary-mass Companion HD 106906 b** — Marta Bryan (UC — Berkeley)
2:15 **Astronomical spectrographs on a chip - Getting ready for the next-generation telescopes** — Pradip Gatikine (Caltech)
2:30 **Investigating the Signatures of Substellar Ingestion** — Melinda Soares-Furtado (U. Wisconsin — Madison)

Break

Galaxies & Black Holes (Chair: Christina Eilers)

- 3:00 **Neutrino-cooled accretion disks** — Ariadna Murguía Berthier (Northwestern)
3:15 **Bridging insights from semi-analytic and hydrodynamic models of galaxy formation** — Viraj Pandya (Columbia)
3:30 **Physical conditions of the formation site of young massive clusters in galaxy formation simulations** — Hui Li (MIT)
3:45 **Chasing supermassive black holes at the dawn of the Universe** — Lea Marcotulli (Yale)
4:00 **Constraining dynamical formation channels of binary black holes with eccentric observations** — Michael Zevin (U. Chicago)
4:15 **Modeling turbulent evolution of galaxies** — Vadim Semenov (Harvard)
4:30 **Probing the standard cosmological model with the population of binary black-holes** — Jose María Ezquiaga (U. Chicago)

Tuesday, October 26

Exoplanets 2 (Chair: Sebastiaan Haffert)

- 12:00 **Formation of satellites in circumplanetary disks - Uranus** — Raluca Rufu (SWRI)
12:15 **Detection of Water in the Secondary Eclipse Spectrum of the Hot Jupiter WASP-77Ab** — Megan Mansfield (U. Arizona)
12:30 **Towards Generalized Characterization of Exoplanet Atmospheres with Transit Spectroscopy** — Luis Welbanks (Arizona State)
12:45 **Joint optimization of multiple optical planes in a stellar coronagraph** — Emiel Por (STScI)
1:00 **Studying exoplanetary magnetic fields using radio emission observations** — Jake Turner (Cornell)

Break

Milky Way and the Local Group (Chair: Aaron Smith)

- 1:30 ***The Three Dimensional Kinematics of the Low-mass Population within the ONC Core*** — Chris Theissen (UC — San Diego)
- 1:45 ***A 'Quick Look' at All-Sky Galactic Archeology with TESS*** — Marc Hon (U. Hawaii)
- 2:00 ***A New 3D View of Star Formation in our Solar Neighborhood*** — Catherine Zucker (STScI)
- 2:15 ***A STARFORGE view on the dynamics of star formation*** — Mike Grudić (Carnegie Observatories)
- 2:30 ***The dynamic and obscured Milky Way in the near-infrared*** — Kishalay De (MIT)
- 2:45 ***The North Polar Spur puzzle: feedback near vs feedback far?*** — Georgia Panopoulou (Caltech)
- 3:00 ***Stellar Streams from Beyond the Milky Way*** — Sarah Pearson (NYU)

Wednesday, October 27

Supernovae & Transients (Chair: Kishalay De)

- 12:00 ***Advances in Precision Type Ia Supernova Cosmology for the Next Pantheon and SH0ES Analyses*** — Dillon Brout (SAO)
- 12:15 ***Cosmological Results from the RAISIN Survey: Using Type Ia Supernovae in the Near Infrared as a Novel Path to Measure the Dark Energy Equation of State*** — David Jones (UC — Santa Cruz)
- 12:30 ***Transients from Circumstellar Interaction*** — Ben Margalit (UC — Berkeley)
- 12:45 ***Neutrino oscillations in core-collapse supernovae*** — Luke Johns (UC — Berkeley)
- 1:00 ***The ANT Problem*** — Tom Holoien (Carnegie Observatories)

Break

Galaxies 1 (Chair: Yao-Yuan Mao)

- 1:30 ***LYRA: Cosmological dwarf galaxy formation with inhomogeneous Population III enrichment*** — Thales Gutcke (Princeton)
- 1:45 ***Internal structure of elliptical galaxies: the missing piece at the intersection of Astrophysics and Cosmology*** — Anowar Shajib (U. Chicago)
- 2:00 ***A galaxy formed mostly by star formation in massive, extremely dense clumps of gas*** — Shany Danieli (Princeton)
- 2:15 ***Cold Gas Content and Baryon Cycling in Subsolar Metallicity Galaxies at $z \sim 2$*** — Ryan Sanders (UC — Davis)
- 2:30 ***Suppressing star formation by tidal removal of cold gas from a high-redshift post-starburst galaxy*** — Justin Spilker (UT — Austin)

Thursday, October 28

Galaxies 2 (Chair: Mike Grudic)

- 1:00 ***Revealing Optically-Obscured Dusty Star-Forming Galaxies in the Early Universe and Characterization of 2mm-detected Sources*** — Sinclaire Manning (U. Mass — Amherst)
- 1:15 ***Probing the Early Universe with Distant Quasars*** — Feige Wang (U. Arizona)
- 1:30 ***Lyman-alpha emission and transmission during the Epoch of Reionization*** — Aaron Smith (MIT)
- 1:45 ***Fundamental Physics of Dark Matter from Dwarf Galaxy Surveys*** — Yao-Yuan Mao (Rutgers)
- 2:00 ***Multi-messenger studies with DESI*** — Antonella Palmese (UC — Berkeley)

Break

Black Holes (Chair: Antonella Palmese)

- 2:30 *Images of Supermassive Black Hole Accretion Flows: Magnetic Fields and Inner Shadows* — Andrew Chael (Princeton)
- 2:45 *Supermassive Black Holes in the Early Universe* — Anna-Christina Eilers (MIT)
- 3:00 *Unraveling how black holes power explosive outflows with the time-domain* — Alexandra Tetarenko (Texas Tech)
- 3:15 *The Size, Shape, and Scattering of Sagittarius A** — Sara Issaoun (SAO)

Break

Stars (Chair: Ryan Sanders)

- 3:45 *The impact of red supergiant mass-loss on stellar evolution* — Emma Beasor (NOIRLab)
- 4:00 *Reconstructing Neutron Star Masses from Metal-poor Stars* — Erika Holmbeck (Carnegie Observatories)
- 4:15 *Stars Stripped in Binaries: from Theory to Observation* — Ylva Götberg (Carnegie Observatories)
- 4:30 *Radial Constraints from NICER-NuSTAR observations of the NS LMXB Cygnus X-2* — Renee Ludlam (Caltech)
- 4:45 *The Empirical Evolution of Red Giants* — Jamie Tayar (U. Hawaii)

Friday, October 29

Exoplanets 3 (Chair: Raluca Rufu)

- 12:00 *What are the initial conditions of planet formation?* — Aleksandra Kuznetsova (AMNH)
- 12:15 *A 3D View of Planetary Orbital Architectures* — Sarah Milholland (Princeton)
- 12:30 *Scaling K2: Exploring planet demographics trends with stellar metallicity* — Jon Zink (Caltech)
- 12:45 *Direct imaging of temperate and mature exoplanets with MagAO-X and GMagAO-X* — Sebastiaan Haffert (U. Arizona)
- 1:00 *Connecting Planet Formation & Characterization* — Diana Powell (SAO)
- 1:15 *Toward predictive models of terrestrial planet atmospheric evolution* — Joshua-Krissanen-Totton (UC — Santa Cruz)
- 1:30 *Small Circumbinary Planets - Do They Exist And How Do We Find Them?* — David Martin (Ohio State)

Break

High Energy & Cosmology (Chair: Erika Holmbeck)

- 2:00 *Updates from the North American Nanohertz Observatory for Gravitational Waves* — H. Thankful Cromartie (Cornell)
- 2:15 *The relative contribution to heavy metals production from binary neutron star mergers and neutron star-black hole mergers* — Hsin-Yu Chen (MIT)
- 2:45 *Comparing the populations of X-ray and gravitational-wave black holes* — Maya Fishbach (Northwestern)
- 3:00 *Dark Matter Daily Modulation With Anisotropic Organic Crystals and Beyond* — Carlos Blanco (Princeton)
- 3:15 *Mirror diffusion of cosmic rays in highly compressible turbulence near supernova remnants* — Siyao Xu (IAS)
- 3:30 *Fundamental Cosmology from Galaxy Clustering* — Nikhail Ivanov (IAS)