

- **Date sent:** 30 November 2021, 18:01
- **From:** Nanda Rea
- **To:** Division D High Energy Phenomena and Fundamental Physics
- **Subject:** IAU Division D (High energy phenomena and fundamental physics) Newsletter - December 2021

\*\*\*IAU Division D Newsletter, December 2021\*\*\*

## INDEX

- \* Division D workshop at the 2022 General Assembly
- \* Call for nominations for the Gruber Cosmology Prize
- \* IAU PhD prizes
- \* Upcoming Conferences, Meetings, Workshops
- \* In memoriam

---

---

Division D workshop at the 2022 General Assembly

## ACROSS THE MASS SPECTRUM OF NEUTRON STARS AND BLACK HOLES

August 5 and 8, 2022, Busan (Korea)

<http://www.iauga2022.org/>

-- Scientific rationale

Black holes and neutron stars are now being observed in more ways than ever before, across all wavelengths from radio to gamma rays, and as gravitational-wave sources in binary inspirals. This multi-messenger toolkit provides insights into the intrinsic properties of these compact, strongly gravitating objects. Knowing their mass is essential to interpreting the various facets of their activity, yet their mass distribution also reflects the history of their formation in a single collapse or in a merger event, as well as their accretion history before and after formation. Furthermore, the maximum mass of neutron stars and their mass-radius relation place important constraints on the equation of state of cold neutron matter at nuclear densities. Mass functions and demographics are therefore helpful to elucidate the structure of compact objects and their evolutionary history.

Recent observations have dramatically expanded our views on the mass range of neutron stars and black holes, so Division D is organising a workshop to review these findings.

For black holes, we will review the surprisingly large masses found by gravitational-wave events in the stellar graveyard and will explore how stellar evolution and environmental dynamics can produce them. The workshop will explore what the implications are of the relatively poor census of black holes in the intermediate  $10^2$ - $10^5$  solar-mass domain, contextualized per a range of theoretical predictions. The workshop will review the different means to measure the mass of supermassive objects (e.g. from gas or stellar motions, reverberation mapping, tidal disruption events, accretion luminosities, etc.), including those of Sgr A\* and M87. We will examine how black-hole masses scale with the velocity dispersion or stellar mass in the surrounding bulge as the black holes and their host galaxies co-evolve. The program will discuss how black holes heavier than a billion solar masses can form rapidly, within a few hundred million years after the Big Bang, and from which type of seeds they can grow.

-- Contributions

The research topics listed above are not exhaustive. To build an exciting and enlightening program, we welcome ideas and contributions. Abstracts are due on the General Assembly 2022 website before March 31st, 2022 :

[http://www.iauga2022.org/submission/submission\\_01.asp?sMenu=abo1](http://www.iauga2022.org/submission/submission_01.asp?sMenu=abo1)

=====  
\* Call for nominations for the Gruber Cosmology Prize

The Gruber Foundation invites nominations on behalf of individuals whose achievements in cosmology would make them suitable candidates for the 2022 Gruber International Prize Program. The foundation awards prizes annually in the fields of cosmology, genetics and neuroscience.

The Gruber Cosmology Prize honours a leading cosmologist, astronomer, astrophysicist, or scientific philosopher for theoretical, analytical, conceptual or observational discoveries leading to fundamental advances in our understanding of the Universe.

Each prize is accompanied by a \$500 000 unrestricted monetary award and is designed both to recognise groundbreaking work in each field and to inspire additional efforts that effect fundamental shifts in knowledge and culture. Recipients are selected by a committee of distinguished experts in each field. In the case of the cosmology prize, the committee is nominated by the IAU and three other international scientific unions in relevant fields.

remarkable work in the previous year (i.e. a PhD Thesis which has been defended between the 16 December in the previous year, and 15 December this year).

Deadline: December 15, 2021.

[https://www.iau.org/science/grants\\_prizes/phd\\_prize/](https://www.iau.org/science/grants_prizes/phd_prize/)

=====  
\* Upcoming Conferences, Meetings, Workshops

Dark Sectors of Astroparticle Physics, ASTRODARK-2021

December 7-10, 2021

Virtual

<https://indico.ipmu.jp/event/397/>

Science at Low Frequencies (SALF) VIII

December 6-9, 2021

Virtual

<https://salfconference.org/salfviii/>

Gravitational Wave Physics and Astronomy Workshop

December 14-17, 2021

Hannover, Germany (with remote participation option)

<https://gwpaw2021.aei.mpg.de/>

Dynamical Formation of Gravitational Wave Sources

January 2-7, 2022

Aspen, USA

<https://sites.northwestern.edu/aspengw2022/>

The 239th meeting of the AAS (with the Historical Astronomy and High Energy  
Astrophysics Divisions)

January 9-13, 2022

Salt Lake City, USA

<https://aas.org/meetings/aas239>

Quasars and Galaxies through Cosmic Time

January 24-27, 2022

Virtual

Exploring the Transient Universe with the Nancy Grace Roman Space Telescope

February 8-10, 2022

Pasadena, USA (hybrid online)

<https://conference.ipac.caltech.edu/romantimedomain/>

The present and future of Astronomy - A critical look at hiring, evaluation processes, the way we do science and our role in society

February 14-18, 2022

Virtual

<https://www.eso.org/sci/meetings/2022/ASTRO2022.html>

The dawn of astrometric microlensing, from cold exoplanets to black-holes

February 21-23, 2022

Paris, France (hybrid online)

<https://www.cold-worlds.com/nouvelles-scientifiques/workshops-2022/>

=====  
\*In memoriam

We are sorry to learn of the passing of:

Prof. William G. Mathews from the University of California Observatories,

[https://www.legacy.com/us/obituaries/santacruzsentinel/name/william-mathews-obituary?id=24538828&\\_cf\\_chl captcha tk\\_=AZXN.ItWGq2ZLJ1v3snJsx9xsfxuij11J32CNV5iDO8-1636049714-0-gaNycGzNB30](https://www.legacy.com/us/obituaries/santacruzsentinel/name/william-mathews-obituary?id=24538828&_cf_chl captcha tk_=AZXN.ItWGq2ZLJ1v3snJsx9xsfxuij11J32CNV5iDO8-1636049714-0-gaNycGzNB30)

Prof. Richard A. McCray from the University of Colorado Boulder,

<https://obituaries.neptunesociety.com/obituaries/arvada-co/richard-mccray-10422017>

and Dr. Paul Gorestein from the High Energy Astrophysics Division, Harvard-Smithsonian Center for Astrophysics in Cambridge

<https://www.legacy.com/us/obituaries/bostonglobe/name/paul-gorenstein-obituary?id=31673690> .

=====  
If you wish to share with IAU Division D any information about matters that may be relevant