

Přednášející: D. Lančová
Datum a čas: 9.12. 2021, 13:00

Přednášející: E. Kopteva
Datum a čas: 2.12. 2021, 13:00
Místo: Místnost 219

(T-23) days till the JWST launch: new horizons

Přednášející: Michal Zajaček
Datum a čas: 25.11. 2021, 13:00

Popis: On December 18, 2021 we are expecting the rocket launch of the year - James Webb Space Telescope (JWST) will be launched on the Ariane 5 rocket from the ESA Kourou station in French Guiana. After about one-month journey to its final destination, 1.5 mil. km distant L2 point, it will start observing the Universe at infrared wavelengths between 0.6 to 28.5 micrometers. I will describe the main four scientific instruments of the JWST (NIRCam, NIRSpec, MIRI, NIRISS) and the main scientific objectives (first stars and galaxies in the Universe, formation of stars and protoplanets, exoplanets, Solar System bodies). Then I will specifically focus on the special program of the JWST: the observations of the Galactic center, some of which will be performed in parallel with the Event Horizon Telescope observations at 2.1 and 4.8 micrometers to study the flare emission. One of the main questions JWST will help to answer is if stars are still forming in the Galactic center and it will clarify the subsolar population of massive starburst clusters like the Arches and the Quintuplet clusters. These dense clusters contain up to 10^4 Solar masses of stars and the JWST will shed light on the initial mass function in these dense clusters and the circumstellar disc lifetime in the dense and the harsh environment.

Full reconstruction of LST data with convolutional neural networks

Přednášející: J. Juryšek
Datum a čas: 18.11. 2021, 13:00
Místo: Místnost 219

Quantum computing: geometry of finite-dimensional quantum systems, Bures metric, indicators of quantumness

Přednášející: M. Bureš
Datum a čas: 11.11. 2021, 13:00
Místo: Místnost 219

Simulations of accreting neutron stars and pulsating ULXs

Přednášející: David Abarca
Datum a čas: 4.11. 2021

Popis: Observations of ULXs with coherent ~ 1 s pulsations have shown that accreting neutron stars can produce super-Eddington luminosities. The exact mechanism for the production of such large luminosities is still up for debate, but we investigate the possibility that accretion above the critical

rate produces beamed emission which causes the source to appear many times brighter. We model these objects using general relativistic magnetohydrodynamic simulations (GRRMHD) of super-critical accretion onto magnetized neutron stars. I will discuss the results of our model, the effect the inner boundary condition has on the simulation, and some of the challenges involved in including large magnetic fields into GRRMHD simulations. A constant feature of our simulations is the strong outflows from the super-Eddington disks which beam the outgoing emission and produce luminosities corresponding to those measured for pulsating ULXs.

Long term X-ray time-lags studies

Přednášející: A. Karakontantakis

Datum a čas: 21.10. 2021, 13:00

Popis: The X-ray emission from AGN is highly variable, on short (minutes/hours/day) and long (months/years) time scales. A particular characteristic of the observed variations is that the higher energy band variations are delayed with respect to lower energy photons. I will present the long term, frequency dependent, X-ray time-lags of the Seyfert galaxies NGC 4051, MCG-6-30-15, Ark 564 and Mkn 766 in the 2-4, 4-7, and 7-10 keV bands. I will combine these results with the results from the model fitting of the time lags at higher frequencies to investigate if these delays at low frequencies are consistent with the time-lag estimates at higher frequencies.

Numerical simulations of star-disk magnetospheric interaction

Přednášející: M. Cemeljic

Datum a čas: 14. 10. 2021, 13:00

Místo: Místnost 219

Popis: I will present results of my recent works on star-disk magnetospheric interaction with PLUTO code. Interesting trends are found in the transport of angular momentum in star-disk systems, which can be compared with the observational results from the young stellar objects like T-Tauri stars or close binary systems with dense central objects and a thin accretion disk.

Moving-mesh radiation hydrodynamics and application to wind-reprocessed transients

Přednášející: D. Calderon

Datum a čas: 7.10. 2021, 13:00

Spinning test particle oscillations and its application to QPOs

Přednášející: Misbah Shahzadi

Datum a čas: 10.9. 2021

Nahrávka na YouTube: <https://youtu.be/9DzCbl9OeYg>

Projects in Strong-Field General Relativity: my worldline with Pavel Bakala

Přednášející: Luigi Stella

Datum a čas: 10.9. 2021

Nahrávka na YouTube: <https://www.youtube.com/watch?v=t7pYogrHbyM&t=3s>

Thick accretion disk in an external gravitational and electromagnetic field

Přednášející: Audrey Trova

Datum a čas: 9.9. 2021

Nahrávka na YouTube: <https://youtu.be/XGH-Wsh3WVM>

Neutron star radius-to-mass ratio from accretion disc occultation

Přednášející: Riccardo La Placa

Datum a čas: 9.9. 2021

Nahrávka na YouTube: <https://www.youtube.com/watch?v=U3gCMO-LFhk>

Gravitational cracking and complexity in the framework of gravitational decoupling

Přednášející: Ernesto Contreras

Datum a čas: 9.9. 2021

Binary neutron star coalescence - after the merger

Přednášející: John Miller

Datum a čas: 8.9. 2021

Nahrávka na YouTube: <https://youtu.be/z-lkASpeliY>

Gravitating razor-thin discs around Schwarzschild black holes via the "displace, cut, and reflect" method

Přednášející: R. Vieira

Datum a čas: 8.9. 2021

Nahrávka na YouTube: <https://youtu.be/FmUO0Kg3yQw>

Current and future tests of gravity with black hole shadows

Přednášející: M. Wielgus

Datum a čas: 7.9. 2021

Nahrávka na YouTube: <https://youtu.be/OiPa-lr2CTw>

Inverse problem in black hole imaging

Přednášející: Jose Guillermo Lara Delgado

Datum a čas: 7.9. 2021

S3 detector of reactor antineutrinos

Přednášející: K. Smolek

Datum a čas: 17.6. 2021, 14:00

Gravitational Lensing in Simulated Images of Black Holes

Přednášející: Z. Gelles

Datum a čas: 10.6. 2021, 17:00

Global numerical simulations of accretion flow in the vicinity of Black Hole

Přednášející: B. Mishra

Datum a čas: 13.5. 2021, 17:00

Polarized emission around the M87 supermassive black hole

Přednášející: M. Wielgus

Datum a čas: 29.4. 2021, 13:00