

# Schedule for MODEST-24

Venue: Nicolaus Copernicus Astronomical Center, Bartycka 18, Warsaw 00-716

All talks will take place in the main lecture hall. All times are listed in Central European Summer Time (CEST).

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## Conference Day 1: Monday (19th August)

08:00 – 09:00 Registration/Check-in (Reception Area)

09:00 – 09:10 Welcome & Practical Information (Main Lecture Hall)

Morning Session (Chair: Paolo Bianchini)

### *Formation of Dense Stellar Systems*

- 09:10 to 09:30 - Natalia Lahén - *“Formation and evolution of star clusters in galactic environments”*
- 09:30 to 09:50 - Floor van Dokkelaar - *“The GigaEris Simulation: Stellar clusters in MW-sized galaxies at  $z>4$ ”*
- 09:50 to 10:10 - Megan Allen - *“Long Term Evolution and Dissolution of Star-Forming Regions”*
- 10:10 to 10:30 - Daniel Han - *“Impact of Radiation Feedback on the Formation of Globular Cluster Candidates during Cloud-Cloud Collisions”*

10:30 – 10:55 Coffee Break

- 10:55 to 11:15 - Mirek Giersz - *“Multiple Stellar Populations: Speculations on Cluster Migration and Gas Re-Accretion”*
- 11:15 to 11:35 - Maria Vittoria Legnardi - *“The original composition of the gas forming first-population stars in globular clusters”*
- 11:35 to 11:55 - Ugo Niccolò Di Carlo - *“Clumpy Star Clusters: Rethinking IMF Limits”*
- 11:55 to 12:15 - Elena Lacchin - *“Realistic initial conditions for young stellar clusters”*
- 12:15 to 12:35 - Michael Fellhauer - *“Can we verify the Dissolving Star Cluster Model as a Formation channel for dSph galaxies?”*

12:35 – 14:00 Lunch Break

Afternoon Session (Chair: Michael Fellhauer)

### *Nuclear Star Clusters and Galactic Nucleus*

- 14:00 to 14:20 - Peter Berczik - *“Formation and evolution of the Nuclear Star Cluster in the Milky Way and other spiral galaxies on the cosmological time scale”*
- 14:20 - 14:40 - Anja Feldmeier-Krause - *“Modelling the Milky Way nuclear star cluster”*
- 14:40 - 15:00 - Eugene Vasiliev - *“Dynamical models of the Milky Way nuclear star cluster”*

- **15:00 to 15:20 - Matteo Sadun Bordoni** - *“The extended mass distribution in the Galactic center”*

#### **15:20 – 15:45 Coffee Break**

- **15:45 to 16:05 - Yoko Funato** - *“Orbital Evolution of S Stars Due to Resonant Relaxation”*
- **16:05 to 16:25 - Hanxi Wang** - *“Statistical Mechanics in the Galactic Center: Anisotropic Mass segregation and Phase Transition”*

#### **16:25 – 18:30: Flash Poster Presentations + Viewing**

#### **End of Day 1**

## **Conference Day 2: Tuesday (20th August)**

### **Morning Session (Chair: Debatri Chattopadhyay)**

#### ***Observational Properties of Dense Stellar Systems in Different Environments***

- **09:00 to 09:20 - Alessandro Della Croce** - *“Tracing massive star cluster formation: insights from the LISCA project“*
- **09:20 to 09:40 - Tuila Ziliotto** - *“Kinematics of Multiple Stellar Populations in Globular Clusters with JWST”*
- **09:40 to 10:00 - Marilyn Latour** - *“Metallicity variations among the primordial stellar population in Galactic globular clusters: A MUSE spectroscopic survey”*
- **10:00 to 10:20 - Renuka Pechetti** - *“Unveiling the Heart of Darkness: Modelling the Central Kinematics of Omega Centauri and Its Elusive Black Hole”*

#### **10:20 – 10:45 Coffee Break**

- **10:45 to 11:05 - Stephanie Monty** - *“Galactic Archaeology with Globular Clusters - Europium is a Chemical Tag Between Globular and their Hosts Across All Metallicities”*
- **11:05 to 11:25 - Sara Saracino** *“Binaries in massive clusters with MUSE: Omega Cen and NGC 1850”*
- **11:25 to 11:45 - Vikrant Jadhav** - *“Rotation and expansion in open clusters using simulations and Gaia DR3”*
- **11:45 to 12:05 - Xiaoying Pang** - *“Bulk rotation in star cluster via N-Body simulations and observations”*
- **12:05 to 12:25 - Henriette Wirth** - *“On the effects of unresolved binaries on the deduced total mass and stellar mass function of stellar clusters”*

#### **12:25 – 14:00 Lunch Break**

## Afternoon Session (Chair: Anja Feldmeier-Krause)

### **Numerical Approaches to Modelling Stellar Systems and their Constituents**

- **14:00 to 14:20 - Paolo Bianchini** - *“The emergence of angular momentum in globular clusters: insights from large N-body simulations”*
- **14:20 to 14:40 - Long Wang** - *“The strong impact of IMF in star cluster dynamics”*
- **14:40 to 15:00 - Nathan Leigh** - *“The Four-Body Problem in Newtonian Gravity”*
- **15:00 to 15:20 - Alessandro A. Trani** - *“Isles of regularity in a sea of chaos amid the gravitational three-body problem”*
- **15:20 to 15:40 - Vaclav Pavlik** - *“Relaxation and evolution towards inverse energy equipartition in star clusters”*

### **15:40 – 16:05: Coffee Break**

- **16:05 to 16:25 - Steven Rieder** - *“Updates on AMUSE”*
- **16:25 to 16:45 - Francisco Aros** - *“Dynamical mixing of multiple populations in globular clusters”*
- **16:45 to 17:05 - Aleksey Generozov** - *“Gas and multiple evolution in young star clusters and other gas-rich environments”*
- **17:05 to 17:25 - Francesco Maria Flammini Dotti** - *“The dynamics of planet-like objects in star clusters”*

### **17:25 – 18:00: Virtual Poster Session**

### **19:00 Museum Tour (First Group)**

### **End of Day 2**

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## **Conference Day 3: Wednesday (21st August)**

### **Morning Session (Chair: Manuel Arca Sedda)**

### **Special Session Dedicated to Prof. Rainer Spurzem and Prof. Roberto Capuzzo Dolcetta**

- **09:00 to 09:25 - Douglas Heggie** - *“Simulating the evolution of star clusters: Risks and rewards”*
- **09:25 to 09:45 - Sara Rastello** - *“The scientific journey of Prof. Roberto Capuzzo Dolcetta among stellar clusters and galactic nuclei”*
- **09:45 to 10:05 - Peter Berczik** - *“Rainer Spurzem: The history and art of direct N-body modelling around the globe”*
- **10:05 to 10:25 - Roberto Capuzzo-Dolcetta** - *“Are Dwarf Spheroidal and Ultra Faint Dwarf galaxies the most dark matter dominated stellar systems?”*
- **10:25 to 10:45 - Rainer Spurzem** - *“How it all started”*

### **10:50 – 11:20 Coffee Break**

## **Numerical Approaches to Modelling Stellar Systems and their Constituents: Stellar and Binary Evolution**

- **11:20 to 11:40 - Poojan Agrawal** - *“Decoding binary evolution: insights from stripped stars”*
- **11:40 to 12:00 - Francesco Gabrielli** - *“The cosmic rate of pair-instability supernovae”*
- **12:00 to 12:20 - Amedeo Romagnolo** - *“Very massive stars do not expand: the uneventful life at the massive end of the IMF”*

**12:20 – 13:45 Lunch Break**

**Afternoon Session (Chair: Lavinia Paiella)**

### ***Stellar Multiplicity, Exotica, and Transients in Star Clusters***

- **13:45 to 14:05 - Stefan Dreizler** - *“Binaries in 47 Tuc: Confronting cluster simulations with observations”*
- **14:05 to 14:25 - Lazaros Souvatzis** - *“Runaway and Hyper-runaway Stars from Merging Star Clusters with Massive Black Holes”*
- **14:25 to 14:45 - Sara Rastello** - *“Stars and Black Holes in Young Star Clusters: Friends or Foes?”*
- **14:45 to 15:05 - Steffani Grondin** - *“From Clustered Environments to Common Envelopes: The first systematic identification of white dwarf-main sequence post-common envelope binaries in star clusters”*
- **15:05 to 15:25 - Dany Atallah** - *“Binary Formation from Three Initially Unbound Bodies”*

**17:00 - 22:00: Boat Cruise + Conference Dinner**

**End of Day 3**

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## **Conference Day 4: Thursday (22nd August)**

**Morning Session (Chair: Sebastian Kamann)**

### ***Stellar Multiplicity, Exotica, and Transients in Star Clusters (continued)***

- **09:00 to 09:20 - Kaushar Rishikesh Vaidya** - *“Investigating Blue Straggler Stars of Open Clusters and Fields using UVIT/AstroSat”*
- **09:20 to 09:40 - Yuzhe Song** - *“Modelling Millisecond Pulsar Populations in Globular Clusters with NBODY6++GPU”*
- **09:40 to 10:00 - Kwangmin Oh** - *“Probing Intracluster Dynamics and Evolution of Globular Clusters through Cataclysmic Variable Populations”*
- **10:00 to 10:20 - Arkadiusz Hypki** - *“MOCCA: Dynamical blue stragglers excess after core collapse”*
- **10:20 to 10:40 - Alonso Herrera Urquieta** - *“A systematic method to identify runaways from star clusters produced from single-binary interactions: A case study of M67”*

**10:40 – 11:05 Coffee Break**

- **11:05 to 11:25 - Ataru Tanikawa** - *“Inert compact binary formation in open clusters”*
- **11:25 to 11:45 - Taeho Ryu** - *“Magnetic field amplification during stellar collisions and its implication for blue stragglers”*
- **11:45 to 12:05 - Arunima Dutta** - *“A study of the exotic pulsars in the globular cluster NGC 1851”*
- **12:05 to 12:25 - Fabrizio Muratore** - *“Exploring the phenomenon of split main sequence in young star clusters via binary stars”*
- **12:25 to 12:45 - Koushik Sen** - *“Whispering in the dark: X-ray faint black holes around OB stars”*

**12:45 – 14:15 Lunch Break**

**Afternoon Session (Chair: Iwona Kotko)**

- **14:15 to 14:35 - Liliana Rivera Sandoval** - *“The importance of dynamics in the cataclysmic variables in globular clusters”*
- **14:35 to 14:55 - Ryutaro Iwakura** - *“The disintegration process and orbital evolution of equal-mass hierarchical triple systems”*
- **14:55 to 15:15 - Grzegorz Wiktorowicz** - *“Synthetic Populations of Ultra-Luminous X-ray Sources in Globular Clusters”*
- **15:15 to 15:35 - Christina Schoettler** - *“The effect of dynamically formed binaries on young planetary systems”*
- **15:35 to 15:55 - Fraser Evans** - *“The ejection of hypervelocity stars from Milky Way globular clusters”*

**15:55 – 16:20 Coffee Break**

***Chris Belczynski Memorial Session on Compact Objects and Gravitational Wave Sources***

- **16:20 – 16:40 - Tomasz Bulik’s talk about Chris’ life and scientific work**
- **16:40 to 17:00 - Sambaran Banerjee** - *“Stellar-mass binary black hole mergers and dormant black hole-star binaries from young massive and open star clusters”*
- **17:00 to 17:20 - Jakub Klencki** - *“Through the mantle of hydrogen: understanding mass transfer in black hole - star systems and the formation of binary black hole mergers”*
- **17:20 to 17:40: Benedetta Mestichelli** - *“The ones that got away: formation and evolution of intermediate-mass black holes in massive star clusters”*
- **17:40 to 18:00 - Lavinia Paiella** - *“Seeds to success: growing heavy black holes in dense star clusters”*

**19:00 Museum Tour (Second Group)**

**End of Day 4**

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## Conference Day 5: Friday (23rd August)

### Morning Session (Chair: Tomasz Bulik)

#### *Chris Belczynski Memorial Session on Compact Objects and Gravitational Wave Sources (continued)*

- **09:00 to 09:20 - Maximilian Häberle** - *“New evidence for an intermediate-mass black hole in  $\omega$  Centauri”*
- **09:20 to 09:40 - Zhao Su** - *“Do Intermediate-Mass Black Holes Exist in Galactic Globular Clusters? - Clues From X-ray Observations and Hydrodynamical Simulations”*
- **09:40 to 10:00 - Taras Panamarev** - *“The case of an IMBH in the galactic centre: insights from N-body simulations”*
- **10:00 to 10:20 - Konstantinos Kritos** - *“Star cluster properties from intermediate-mass black hole mergers”*

### 10:20 – 10:45 Coffee Break

- **10:45 to 11:05 - Abbas Askar** - *“Formation of SMBH in galactic nuclei: LISA binaries & intermediate-mass ratio inspirals”*
- **11:05 to 11:25 - Gaia Fabj** - *“Eccentric Mergers in AGN Discs: Influence of the Supermassive Black-Hole on Three-body Interactions”*
- **11:25 to 11:45 - Veronica Vazquez-Aceves** - *“SgrA\* spin and mass estimates through the detection of an extremely large mass-ratio inspiral”*
- **11:45 to 12:05 - Thibaut Francois** - *“Unveiling the Dance of Off-Center Black Hole Duets: Insights from Jacobi Capture in Dwarf Galaxies”*
- **12:05 to 12:25 - Iwona Kotko** - *“Can the X-ray binaries in M83 be the progenitors of gravitational waves sources for LIGO/VIRGO/KAGRA?”*

### 12:25 – 14:00 Lunch Break

### Afternoon Session (Chair: Xiaoying Pang)

- **14:00 to 14:20 - Tristan Bruel** - *“Dynamical formation of binary black holes in massive star clusters: a cosmological approach”*
- **14:20 to 14:40 - Jordan Barber** - *“The Effect of Primordial Binaries and Cluster Dynamics on Binary Black Hole Mergers”*
- **14:40 to 15:00 - Ambreesh Khurana** - *“The role of massive star binarity in the creation of upper mass-gap and intermediate-mass black holes in dense star clusters”*
- **15:00 to 15:20 - Cristiano Ugolini** - *“Constraining the features of the BBH mass distribution through population synthesis simulation”*

### 15:20 – 15:50 Coffee Break

### 15:50 – 17:45 Summary Session with Discussion on Open/Key Questions

End of Conference

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