

# **MICRA2023: microphysics in computational relativistic astrophysics**

## **Report of Contributions**

Contribution ID: 2

Type: **not specified**

# Core-Collapse Supernovae: Current Status, Open Questions, and Multi-messenger Prospects

*Monday, 11 September 2023 09:00 (35 minutes)*

**Presenter:** ANDRESEN, Haakon (Stockholm University)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 3

Type: **not specified**

## **Predicting Which Massive Stars Explode**

*Monday, 11 September 2023 11:40 (10 minutes)*

**Presenter:** GOGILASHVILI, Mariam (Florida State University, Los Alamos National Laboratory)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 4

Type: **not specified**

## Neutrino kinetics in core-collapse supernova

*Monday, 11 September 2023 09:35 (35 minutes)*

**Presenter:** NAGAKURA, Hiroki (National Astronomical Observatory of Japan)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 5

Type: **not specified**

## **Nuclear EOS for general proton fractions and temperature based on chiral EFT interactions**

*Tuesday, 12 September 2023 09:00 (35 minutes)*

**Presenter:** HEBELER, Kai (TU Darmstadt)

**Session Classification:** Equation of State

Contribution ID: 6

Type: **not specified**

## Introduction

*Monday, 11 September 2023 08:45 (15 minutes)*

**Presenters:** PEREGO, Albino (University of Trento, Italy); FROHLICH, Carla (North Carolina State University, United States); O'CONNOR, Evan (Stockholm University, Sweden)

Contribution ID: 7

Type: **not specified**

## Concluding Remarks

*Friday, 15 September 2023 12:25 (20 minutes)*

**Presenters:** PEREGO, Albino (University of Trento, Italy); FROHLICH, Carla (North Carolina State University, United States); O'CONNOR, Evan (Stockholm University, Sweden)

Contribution ID: 8

Type: **not specified**

## **Bayesian inference of the dense matter equation of state within relativistic mean-field framework**

*Tuesday, 12 September 2023 11:05 (20 minutes)*

**Presenter:** BEZNOGOV, Mikhail (National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH))

**Session Classification:** Equation of State



Contribution ID: 9

Type: **not specified**

# Thermal Effects in Binary Neutron Star Mergers

*Wednesday, 13 September 2023 11:20 (20 minutes)*

**Presenter:** FIELDS, Jacob (The Pennsylvania State University)

**Session Classification:** Mergers

Contribution ID: 10

Type: **not specified**

## **Bayesian inference of the dense matter equation of state built within mean field models**

*Tuesday, 12 September 2023 09:55 (20 minutes)*

**Presenter:** RADUTA, Adriana R. (IFIN-HH, Bucharest)

**Session Classification:** Equation of State

Contribution ID: 11

Type: **not specified**

## **The Impact of Nuclear Reaction Rate Uncertainties on Progenitors of Core-Collapse Supernovae**

**Presenter:** FIELDS, Carl (Los Alamos National Laboratory)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 12

Type: **not specified**

## **Relativistic Capabilities of Core-collapse Supernova Simulations in SpECTRE and Flash**

*Monday, 11 September 2023 14:10 (20 minutes)*

**Presenter:** PAJKOS, Michael (Caltech)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 13

Type: **not specified**

## **CCSN simulations with reduced nucleosynthesis networks**

*Monday, 11 September 2023 11:20 (20 minutes)*

**Presenter:** NAVO, Gerard (TU Darmstadt)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 14

Type: **not specified**

## **Long term simulation of supernovae for multi-messenger astronomy**

*Monday, 11 September 2023 11:00 (20 minutes)*

**Presenter:** MORI, Masamitsu (National Astronomical Observatory of Japan)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 15

Type: **not specified**

## Explosive Failed Supernovae

*Monday, 11 September 2023 15:00 (10 minutes)*

**Presenter:** EGGENBERGER ANDERSEN, Oliver (Stockholm University)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 16

Type: **not specified**

## **Thermal behavior as indicator for hyperons in binary neutron star merger remnants**

*Tuesday, 12 September 2023 11:25 (20 minutes)*

**Presenter:** BLACKER, Sebastian (TU Darmstadt)

**Session Classification:** Equation of State



Contribution ID: 17

Type: **not specified**

## **Long term simulations of jet-driven core-collapse supernovae on GPUs**

*Monday, 11 September 2023 14:50 (10 minutes)*

**Presenter:** SHANKAR, Swapnil (API, University of Amsterdam)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 18

Type: **not specified**

# Equations of State for Supernova and Binary Neutron Star Merger Simulations

*Tuesday, 12 September 2023 09:35 (20 minutes)*

**Presenter:** BANDYOPADHYAY, Debades (Aliah University, Newtown Kolkata - 700160)

**Session Classification:** Equation of State

Contribution ID: 19

Type: **not specified**

# **Jets from neutron-star merger remnants and implications for kilonovae**

*Wednesday, 13 September 2023 09:00 (35 minutes)*

**Presenter:** SIEGEL, Daniel

**Session Classification:** Mergers

Contribution ID: 20

Type: **not specified**

## **Impact of full neutrino transport in the zoo of post-merger remnants**

**Presenter:** MILLER, Jonah (Los Alamos National Laboratory)

**Session Classification:** Mergers

Contribution ID: 21

Type: **not specified**

## **Nuclear matter properties in neutron star mergers**

*Wednesday, 13 September 2023 11:40 (20 minutes)*

**Presenter:** JACOBI, Maximilian (TU Darmstadt)

**Session Classification:** Mergers

Contribution ID: 22

Type: **not specified**

# **Dynamics and thermodynamics of accretion discs from numerical relativity simulations of neutron star mergers**

*Wednesday, 13 September 2023 11:00 (20 minutes)*

**Presenter:** CAMILLETTI, Alessandro (University of Trento)

**Session Classification:** Mergers

Contribution ID: 23

Type: **not specified**

# Supplementing BNS Simulations with Artificial Neural Networks

*Wednesday, 13 September 2023 14:00 (20 minutes)*

**Presenter:** HAMMOND, Peter (NP3M, Pennsylvania State University)

**Session Classification:** Mergers

Contribution ID: 24

Type: **not specified**

## **Binary Neutron Star Mergers with Spritz**

*Wednesday, 13 September 2023 14:40 (10 minutes)*

**Presenter:** GIACOMAZZO, Bruno (University of Milano)

**Session Classification:** Mergers



Contribution ID: 25

Type: **not specified**

## **Neutrino Flavor Transformation in Neutron Star Mergers**

*Thursday, 14 September 2023 09:00 (35 minutes)*

**Presenter:** MCLAUGHLIN, Gail (North Carolina State University)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 26

Type: **not specified**

## **Neutrino interactions in dense and hot matter**

*Thursday, 14 September 2023 09:35 (35 minutes)*

**Presenter:** OERTEL, Micaela (LUTH-CNRS/Observatoire de Paris)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 27

Type: **not specified**

## **The stellar progenitors of long-duration gamma-ray bursts.**

*Monday, 11 September 2023 14:30 (20 minutes)*

**Presenter:** HALEVI, Goni

**Session Classification:** Core-Collapse Supernovae

Contribution ID: **28**

Type: **not specified**

## **Dynamics of collapsar disk outflow**

*Monday, 11 September 2023 15:10 (10 minutes)*

**Presenter:** DEAN, Coleman (University of Alberta)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 29

Type: **not specified**

## **Nuclear physics of r-process observables**

*Friday, 15 September 2023 09:00 (35 minutes)*

**Presenter:** SURMAN, Rebecca (University of Notre Dame)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 30

Type: **not specified**

## **Galactic chemical Evolution with short lived radioactive isotopes**

*Friday, 15 September 2023 11:05 (20 minutes)*

**Presenter:** WEHMEYER, Benjamin (Konkoly Obs & Univ Hertfordshire)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: **31**

Type: **not specified**

## **The nucleosynthesis of MR-SNe with WinNet**

*Friday, 15 September 2023 10:45 (20 minutes)*

**Presenter:** REICHERT, Moritz (Universitat de Valencia)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 32

Type: **not specified**

## **Stellar weak interaction processes at finite temperature in the relativistic energy density functional theory**

*Friday, 15 September 2023 09:55 (20 minutes)*

**Presenter:** Prof. PAAR, Nils (Faculty of Science University of Zagreb)

**Session Classification:** Nucleosynthesis and Observations



Contribution ID: 33

Type: **not specified**

## **Self-consistent evolution of post-merger ejecta: light curves and nucleosynthesis yields**

*Friday, 15 September 2023 11:45 (10 minutes)*

**Presenter:** MAGISTRELLI, Fabio (Theoretisch-Physikalisches Institut, Friedrich-Schiller Universitat Jena)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 34

Type: **not specified**

## **The Progenitor of the Vela Pulsar was Likely a Binary Merger**

*Friday, 15 September 2023 11:25 (20 minutes)*

**Presenter:** MURPHY, Jeremiah (Florida State University)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 35

Type: **not specified**

## **General relativistic multi-group radiation transport simulations of stellar collapses**

*Thursday, 14 September 2023 11:00 (20 minutes)*

**Presenter:** CHEONG, Patrick Chi-Kit (University of New Hampshire)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 36

Type: **not specified**

# **Systematic Study of Fast and Collisional Neutrino Flavor Instabilities in Core-collapse Supernovae with Boltzmann Neutrino Transport**

*Thursday, 14 September 2023 11:20 (20 minutes)*

**Presenter:** AKAHO, Ryuichiro (Waseda University)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 37

Type: **not specified**

## **Multi-messenger signals of heavy axionlike particles in core-collapse supernovae**

*Thursday, 14 September 2023 14:00 (20 minutes)*

**Presenter:** MORI, Kanji (National Astronomical Observatory of Japan)

**Session Classification:** Neutrinos & other Particles

Contribution ID: **38**

Type: **not specified**

## **Multimessenger inference of neutron star equation of state and gravity**

*Thursday, 14 September 2023 14:20 (20 minutes)*

**Presenter:** BISWAS, Bhaskar (Hamburg University)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 39

Type: **not specified**

## **GRMHD simulations with GR-Athena++**

*Wednesday, 13 September 2023 14:50 (10 minutes)*

**Presenter:** COOK, William (Friedrich-Schiller-Universität Jena)

**Session Classification:** Mergers

Contribution ID: 40

Type: **not specified**

# **The influence of trapped neutrinos on the collapse of BNS merger remnants**

*Thursday, 14 September 2023 15:00 (10 minutes)*

**Presenter:** GUERCILENA, Federico (TIFPA - INFN (Trento))

**Session Classification:** Neutrinos & other Particles



Contribution ID: 41

Type: **not specified**

## **Long-term simulations of Binary neutron star postmerger**

*Wednesday, 13 September 2023 15:00 (10 minutes)*

**Presenter:** NG, Harry Ho-Yin (Institute for Theoretical Physics, Goethe-Universität Frankfurt)

**Session Classification:** Mergers

Contribution ID: 42

Type: **not specified**

## **A new neutrino transport module available in Flash-X**

*Thursday, 14 September 2023 10:40 (20 minutes)*

**Presenter:** ENDEVE, Eirik (Oak Ridge National Laboratory)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 43

Type: **not specified**

## **The impact of different Riemann solvers in neutron star and core-collapse simulations**

**Presenter:** YEOW, Liiyung (The Chinese University of Hong Kong)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 44

Type: **not specified**

## **Impact of improved pair-processes transport on the PNS cooling in 2D CCSN simulations**

*Thursday, 14 September 2023 11:40 (20 minutes)*

**Presenter:** BETRANHANDY, Aurore (Max Planck for gravitational astrophysics)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 45

Type: **not specified**

## **A quantitative criterion to predict the explodability of core-collapse supernovae: the role of the Si/O interface**

*Monday, 11 September 2023 10:40 (20 minutes)*

**Presenter:** BOCCIOLI, Luca (University of Notre Dame)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 46

Type: **not specified**

## **A Parametric Study of the SASI Comparing General Relativistic and Non-Relativistic Treatments**

*Monday, 11 September 2023 14:00 (10 minutes)*

**Presenter:** DUNHAM, Samuel (Vanderbilt University)

**Session Classification:** Core-Collapse Supernovae

Contribution ID: 49

Type: **not specified**

## **Kilonova from different points of view: Combining 3D radiative transfer and numerical-relativity simulations**

*Wednesday, 13 September 2023 15:10 (10 minutes)*

**Presenter:** NEUWEILER, Anna

**Session Classification:** Mergers

Contribution ID: 50

Type: **not specified**

# Quasi-universal relations of gravitational signal from binary neutron star mergers

*Wednesday, 13 September 2023 12:00 (10 minutes)*

**Presenter:** TOPOLSKI, Konrad (Goethe University Frankfurt)

**Session Classification:** Mergers



Contribution ID: 51

Type: **not specified**

## **Impact of nuclear matter properties on the nucleosynthesis and the kilonova from binary neutron star merger ejecta**

*Thursday, 14 September 2023 14:40 (20 minutes)*

**Presenter:** RICIGLIANO, Giacomo (TU Darmstadt)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 52

Type: **not specified**

## **Nucleosynthesis of light and iron group elements in the ejecta of binary neutron star mergers**

*Friday, 15 September 2023 11:55 (10 minutes)*

**Presenter:** CHIESA, Leonardo (Università degli Studi di Trento)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 53

Type: **not specified**

## **Nucleosynthesis of light and iron group elements in the ejecta of binary neutron star mergers**

**Presenter:** PEREGO, Albino (University of Trento, Italy)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 54

Type: **not specified**

## **On using Modern Core Collapse Supernova Models to Interpret Observations**

**Presenter:** BARKER, Brandon (Michigan State University)

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 55

Type: **not specified**

## **Multi-messenger Signals from Magnetized Post-Merger Remnants**

*Wednesday, 13 September 2023 14:20 (20 minutes)*

**Presenter:** BOSCH, Pablo (GRAPPA - University of Amsterdam)

**Session Classification:** Mergers

Contribution ID: 56

Type: **not specified**

## **Multi-messenger Signals from Magnetized Post-Merger Remnants**

**Presenter:** BOSCH, Pablo (GRAPPA - University of Amsterdam)

**Session Classification:** Mergers

Contribution ID: 57

Type: **not specified**

## **First-order transitions at finite temperature**

*Tuesday, 12 September 2023 11:45 (10 minutes)*

**Presenter:** GUERRINI, Mirco (University of Ferrara)

**Session Classification:** Equation of State

Contribution ID: 58

Type: **not specified**

## **Dark matter effects on the equation of state and the properties of neutron star**

**Presenter:** DAS, Harish Chandra (Institute of Physics, Bhubaneswar, India)

**Session Classification:** Equation of State



Contribution ID: 59

Type: **not specified**

## **Impact of microphysics in neutron star merger's remnant simulations**

*Wednesday, 13 September 2023 10:40 (20 minutes)*

**Presenter:** BERNUZZI, Sebastiano (FSU Jena)

**Session Classification:** Mergers

Contribution ID: **60**

Type: **not specified**

## **First-order nucleon-to-quark phase transition: Thermodynamically-consistent constructions other than Maxwell and Gibbs.**

*Tuesday, 12 September 2023 10:45 (20 minutes)*

**Presenter:** CONSTANTINO, Constantinos (INFN/TIFPA)

**Session Classification:** Equation of State

Contribution ID: **61**

Type: **not specified**

**TBD**

*Friday, 15 September 2023 09:35 (20 minutes)*

**Presenter:** LUND, Kelsey

**Session Classification:** Nucleosynthesis and Observations

Contribution ID: 62

Type: **not specified**

## **Constraining the onset density for the QCD phase transition with the supernova neutrino signal**

*Thursday, 14 September 2023 15:10 (20 minutes)*

**Presenter:** KHOSRAVI LARGANI, Noshad (University of Wroclaw)

**Session Classification:** Neutrinos & other Particles

Contribution ID: 63

Type: **not specified**

## **Neutron star mergers with the Lagrangian Numerical Relativity code SPHINCS\_BSSN**

*Wednesday, 13 September 2023 09:35 (35 minutes)*

**Presenter:** ROSSWOG, Stephan

**Session Classification:** Mergers

Contribution ID: **64**

Type: **not specified**

## **intro**

*Tuesday, 12 September 2023 10:45 (20 minutes)*

**Presenter:** FROHLICH, Carla (North Carolina State University, United States)

**Session Classification:** Equation of State

Contribution ID: 65

Type: **not specified**

## Presentation

*Tuesday, 12 September 2023 14:00 (30 minutes)*

**Presenter:** MURPHY, Jeremiah (Florida State University)

**Session Classification:** Early Career Panel

Contribution ID: 66

Type: **not specified**

## Networking

*Tuesday, 12 September 2023 15:00 (30 minutes)*

**Presenter:** FROHLICH, Carla (North Carolina State University, United States)

**Session Classification:** Early Career Panel



Contribution ID: 67

Type: **not specified**

## Fellowships

*Tuesday, 12 September 2023 14:30 (10 minutes)*

**Presenter:** SIEGEL, Daniel

**Session Classification:** Early Career Panel

Contribution ID: **68**

Type: **not specified**

## **Job applications**

*Tuesday, 12 September 2023 14:40 (10 minutes)*

**Presenter:** ROSSWOG, Stephan

**Session Classification:** Early Career Panel

Contribution ID: **69**

Type: **not specified**

## WeakHub

*Thursday, 14 September 2023 15:30 (10 minutes)*

**Presenter:** NG, harry ho-yin (Institute for Theoretical Physics, Goethe-Universität Frankfurt)

**Session Classification:** Neutrinos & other Particles