



# NUSYM 2017

7<sup>th</sup> international symposium on nuclear symmetry energy  
SEPTEMBER 4<sup>TH</sup> - 7<sup>TH</sup> / GANIL, CAEN, FRANCE

## Scientific program of NuSYM17

**Sunday September 3<sup>rd</sup>, 2017**

16:00- 19:00      *Registration at the Workshop Desk (GANIL Guest House)*

**Monday September 4<sup>th</sup>, 2017**

08:00 - 8:30      **Navin Alahari** (*Director of GANIL*)

*Welcome and presentation of the GANIL facilities*

### ***Session 1: Theories of nuclear reactions and symmetry energy 1:***

**Chairman: Pawel Danielewicz** (NSCL, Michigan State University, East Lansing, USA)

08:30 - 09:05      **Hermann Wolter** (University of Munich, GERMANY)

*Transport approaches and reaction studies of the equation of state of asymmetric nuclear matter*

09:05 - 09:35      **Jun Xu** (Shanghai Institute of Applied Physics, CHINA)

*Spin dynamics within a BUU approach*

09:35 - 10:00      **Yongjia Wang** (Huzhou University, CHINA)

*Study of the symmetry energy from the rapidity-dependent elliptic flow*

10:00 - 10:30      Coffee break

### ***Session 2: Theories of nuclear reactions and symmetry energy 2:***

**Chairman: Hermann Wolter** (University of Munich, GERMANY)

10:30 - 11:00      **Lie-Wen Chen** (Shanghai Jiao Tong University, CHINA)

*Empirical information on nuclear matter fourth-order symmetry energy from an extended nuclear mass formula*

11:00 - 11:30      **Stefan Typel** (Institut für Kernphysik, TU Darmstadt & GSI, GERMANY)

*Equations of state of RMF models with different parametrisations of density dependent couplings*

11:30 - 11:50      **Yoritaka Iwata** (Tokyo Institute of Technology, JAPAN)

*Nuclear matter property based on the TDDFT*

11:50 - 12:10      **Tusar Routray** (Sambalpur University, Odisha, INDIA)

*Nuclear Symmetry Energy from the Study of Nuclear Matter and Finite Nuclei using a Finite Range Simple Effective Interaction*

12:10- 12:30      **Wei-Zhou Jiang** (Southeast University, Nanjing, CHINA)

*Properties of Lambda hypernuclei to constrain the symmetry energy*



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12:30 - 14:00 Lunch at the GANIL restaurant

## **Session 3: Correlation & clustering**

**Chairman: Lie-Wen Chen** (Shanghai Jiao Tong University, CHINA)

14:00 - 14:30 **Pawel Danielewicz** (NSCL, Michigan State University, East Lansing, USA)

[Dynamical clusters in transport theories](#)

14:30 - 15:00 **Akira Ono** (Tohoku University Sendai, JAPAN)

[Light clusters and light nuclei in collision dynamics](#)

15:00 - 15:25 **Angelo Pagano** (INFN, Sezione di Catania, ITALY)

[Density and time scale determinations in Heavy Ion collisions at medium energies](#)

15:25 - 15:50 **Arnaud Le Fèvre** (GSI, Darmstadt, GERMANY)

[Detecting clusters in phase space distributions of transport models from Fermi to relativistic energies](#)

15:50 - 16:20 Coffee break

## **Session 4: Symmetry energy in nuclear structure 1**

**Chairwoman : Francesca Gulminelli** (Laboratoire de Physique Corpusculaire, Caen, FRANCE)

16:20 - 16:45 **Kent Paschke** (University of Virginia, USA)

[PREX-II and CREX: Measuring the Neutron Skin of Pb-208 and Ca-48 with Parity Violation in Electron Scattering](#)

16:45 - 17:10 **Concettina Sfienti** (Institut für Kernphysik, J. Gutenberg University, Mainz, GERMANY)

[Status and Prospect of Rn measurements at Mainz](#)

17:10 - 17:35 **Byungsik Hong** (Korea University, SOUTH KOREA)

[Status of RAON and LAMPS in Korea](#)

17:35 - 18:00 **Paolo Russotto** (INFN-Laboratori Nazionali del Sud, Catania, ITALY)

[Plans for studying high-density symmetry energy at GSI](#)

18:00 - 18:20 **Nils Paar** (Faculty of Science University of Zagreb, CROATIA)

[Constraining the symmetry energy based on relativistic point coupling interactions and excitations in finite nuclei](#)

18:20 **End of the session**

18:30 **Welcome cocktail**



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**Tuesday September 5<sup>th</sup>, 2017**

***Session 5: Symmetry energy in nuclear structure 2***

**Chairman : Marek Ploszajczak** (GANIL, Caen, France)

- 08:30 - 09:00 **Maria Colonna** (Laboratori Nazionali del Sud, INFN, Catania, ITALY)  
[Collective excitations as probe of the nuclear effective interaction](#)
- 09:00 - 09:25 **Sergey Sukhoruchkin** (Petersburg Kurchatov Institute, RUSSIA)  
[Symmetry-motivated tuning effect in particle masses and nuclear data](#)
- 09:25 - 09:45 **Xu Chang** (Nanjing University, CHINA)  
[Nuclear symmetry energy constrained by proton/cluster radioactivity](#)
- 09:45 - 10:05 **Hua Zheng** (Laboratori Nazionali del Sud, INFN, Catania, ITALY)  
[Classical vs quantal effects in equilibrium and nonequilibrium dynamics](#)
- 10:05 - 10:30 **Sandrine Courtin** (Institut Pluridi. Hubert Curien, Strasbourg, FRANCE)  
[The 12C+12C and 12C+16O fusion reactions: clusters and astrophysics](#)
- 10:30 - 11:00 Coffee break

***Session 6: Transport codes comparison :***

**Chairwoman: Betty Tsang** (NSCL, Michigan State University, East Lansing, USA)

- 11:00 - 11:15 **Jun Xu** (Shanghai Institute of Applied Physics, CHINA)  
[Current status of Transport code Evaluation project \(TCEP\)](#)
- 11:15 - 11:50 **YingXun Zhang** (China Institute of Atomic Energy, CHINA)  
[Results of TCEP HW1 – NN collisions evaluation](#)
- 11:50 - 12:10 **Maria Colonna** (Laboratori Nazionali del Sud, INFN, Catania, ITALY)  
[Status of HW 2 – Mean field evaluation](#)
- 12:10 - 12:30 **Akira Ono** (Tohoku University Sendai, JAPAN)  
[Status of HW3 – Pion Production](#)
- 12:30 - 14:00 Lunch at the GANIL restaurant



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## *Session 7: Influence of the symmetry energy on the structure of objects and processes in the Femto and astrophysical scales 1*

**Chairwoman:** Anthea Fantina (GANIL, Caen, FRANCE)

- 14:00 - 14:30 **Paolo Napolitani** (IPN-Orsay, FRANCE)  
Inhomogeneity growth in two-component fermionic systems
- 14:30 - 14:55 **Claudio Dorso** (FCEN, University of Buenos Aires, ARGENTINA)  
Fragmentation of Neutron Star Pasta
- 14:55 - 15:20 **Francesca Gulminelli** (Laboratoire de Physique Corpusculaire de Caen, FRANCE)  
Empirical equation of state for dense nucleonic matter and predictions for NS properties
- 15:20 - 15:40 **Xavier Vinas** (Facultat de Física, Universitat de Barcelona, SPAIN)  
Crust-core transition in neutron stars revisited
- 15:40 - 16:00 **Debarati Chatterjee** (Laboratoire de Physique Corpusculaire de Caen, FRANCE)  
A unified nuclear Equation of State based on empirical parameters constrained by nuclear observables
- 16:00 - 16:20 **Wei Sina** (Southeast University, Nanjing, CHINA)  
The properties of symmetry energy in the saturated Nambu-Jona-Lasinio model
- 16:20 - 16:50 Coffee break

## *Session 8: Influence of the symmetry energy on the structure of objects and processes in the Femto and astrophysical scales 2*

**Chairman:** Jerzy Lukasik (Institute of Nuclear Physics PAN, POLAND)

- 16:50 - 17:15 **Sebastian Kubis** (Kraków University of Technology, POLAND)  
Geometric approach to pasta phases
- 17:15 - 17:35 **Tsuyoshi Miyatsu** (Tokyo University of Science, JAPAN)  
Density and momentum dependence of nuclear symmetry energy in the relativistic Hartree-Fock approximation
- 17:35 - 17:55 **Kazuhiro Oyamatsu** (Aichi Shukutoku University, JAPAN)  
How the structure of nuclei and neutron stars depends on the pressure of asymmetric nuclear matter
- 17:55 - 18:15 **Youngman Kim** (Institute for Basic Science, Daejeon, SOUTH KOREA)  
Delta matter in asymmetric dense matter
- 18:15 - 18:35 **Shougaijam Singh** (University of Delhi, INDIA)  
Effect of amplitude in compact star rotation by cosmological parameter
- 18:35 End of the session



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**Wednesday September 6<sup>th</sup>, 2017**

## **Session 9: Symmetry energy & Pion production 1**

**Chairman: Wolfgang Trautmann** (GSI, Darmstadt, GERMANY)

- 08:30 - 09:00 **Che-Ming Ko** (Texas A&M University, College Station, USA)  
[Pion production in HIC](#)
- 09:00 - 09:25 **Dan Cozma** (IFIN-HH Bucharest, ROMANIA)  
[Constraining the Density Dependence of the Symmetry Energy Using the Multiplicity and Average  \$P\_T\$  Ratios of Charged Pions](#)
- 09:25 - 09:55 **Christoph Hartnack** (Subatech, Nantes, FRANCE)  
[Pion production in the IQMD transport model](#)
- 09:55 - 10:15 **Ikeno Natsumi** (Tottori University, JAPAN)  
[Pauli blocking effects on pion production in central collisions of neutron-rich nuclei](#)
- 10:15 - 10:45 Coffee break

## **Session 10: Symmetry energy & Pion production 2**

**Chairman: Remi Bougault** (Laboratoire de Physique Corpusculaire de Caen, FRANCE)

- 10:45 - 11:15 **Betty Tsang** (Michigan State University, East Lansing, USA)  
[Pion production in rare-isotope collisions](#)
- 11:15 - 11:35 **Kaneko Masanori** (Kyoto University & RIKEN Nishina Center, JAPAN)  
[Analysis status on the Kyoto multiplicity array for the SPiRIT experiment](#)
- 11:35 - 11:55 **Nishimura Mizuki** (RIKEN Nishina Center, JAPAN)  
[Collective Flow Analysis in Sn + Sn collisions at 270MeV/u with S \$\pi\$ RT-TPC](#)
- 11:55 - 12:20 **Zhaoqing Feng** (Institute of Modern Physics, Chin. Acad. of Sci., CHINA)  
[Particle production and isospin effect in antiproton-nucleus collisions](#)
- 12:20 - 13:45 Lunch at the GANIL restaurant
- 14:00 Departure for the excursion (bus next to the GANIL Guest house)
- 19:30 Arrival from the excursion (bus arrival at the GANIL Guest house)
- 20:00 **Bus to the social dinner**
- 20:30 **Social dinner (Center of town)**



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**Thursday September 7<sup>th</sup>, 2017**

***Session11 : Constraining Symmetry energy with heavy-ion reactions 1***

**Chairman: Byungsik Hong** (Korea University, SOUTH KOREA)

- 09:00 - 09:25 **Sherry Yennello** (Texas A&M University College Station, USA)  
[NZ Equilibration in Fermi-Energy HI Collisions: What can we learn about the EOS?](#)
- 09:25 - 09:50 **Zhigang Xiao** (Tsinghua University, Beijing, CHINA)  
[Experimental studies on the isospin transport and the asymmetric nuclear equation of state in heavy ion collisions](#)
- 09:50 - 10:15 **Olivier Lopez** (Laboratoire de Physique Corpusculaire de Caen, FRANCE)  
[Recent results from INDRA & FAZIA](#)
- 10:15 - 10:45 Coffee break

***Session 12: Constraining Symmetry energy with heavy-ion reactions 2***

**Chairman: John Frankland** (GANIL, Caen, FRANCE)

- 10:45 - 11:10 **Yvonne Leifels** (GSI, Darmstadt, GERMANY)  
[Opportunities at GSI/FAIR](#)
- 11:10 - 11:35 **Jerzy Lukasik** (Institute of Nuclear Physics PAN, POLAND)  
[KRATTA, KATANA and KRAB](#)
- 11:35 - 12:00 **Dominique Durand** (Laboratoire de Physique Corpusculaire de Caen, FRANCE)  
[ELIE, a phenomenological model for central collisions in the intermediate energy range: comparison with INDRA data](#)
- 12:00 - 12:20 **Patrick St-Onge** (GANIL, Caen, FRANCE)  
[Influence of neutron enrichment on de-excitation properties of palladium isotopes](#)
- 12:20 - 13:45 Lunch at the GANIL restaurant



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## **Session 13: Constraining Symmetry energy with heavy-ion reactions 3**

**Chairman: Giuseppe Verde** (INFN, Sezione di Catania, ITALY & IPN Orsay, FRANCE)

- 13:45 - 14:15 **Bill Lynch** (Michigan State University, East Lansing, USA)  
[Overview of experimental searches of the symmetry energy and of n/p mass splitting.](#)
- 14:15 - 14:40 **Isobe Tadaaki** (RIKEN, Nishina Center, JAPAN)  
[Analysis of SPiRiT experimental data: measurement of charged particles and neutrons in heavy RI collisions](#)
- 14:40 - 15:05 **Jack Winkelbauer** (Michigan State University & Los Alamos National Lab., USA)  
[Impact Parameter Dependence of Isospin Diffusion in Peripheral Sn+Sn Collisions](#)
- 15:05 - 15:30 **Alan McIntosh** (Texas A&M University, College Station, USA)  
[Progress in experimental investigations of the nuclear EoS](#)
- 15:30 – 16:00 Coffee break

## **Session14 : Constraining Symmetry energy with heavy-ion reactions 4**

**Chairwoman: Yvonne Leifels** (GSI, Darmstadt, GERMANY)

- 16:00 - 16:20 **Pierre Morfouace** (NSCL, Michigan State University, East Lansing, USA)  
[Constraining the symmetry energy with heavy-ion collisions and Bayesian analysis](#)
- 16:20 - 16:40 **Giuseppe Politi** (Dipartimento di Fisica e sezione INFN, Catania, ITALY)  
[Isospin influence on Fragments production in 78K r +40Ca and 86K r +48Ca collisions at 10 MeV/nucleon](#)
- 16:40 - 17:00 **Simone Valdré** (GANIL, Caen, FRANCE)  
[Recent results from the ISOFAZIA experiment](#)
- 17:00 - 17:20 **Kyle Brown** (NSCL, Michigan State University, East Lansing, USA)  
[Constraining the effective mass dependence of the Nuclear Symmetry Energy](#)
- 17:20 - 18:00 **Wolfgang Trautmann** (GSI, Darmstadt, GERMANY)  
[Concluding Remarks](#)
- 18:00 - 18:15 Closing NuSYM17



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**Friday September 8<sup>th</sup>, 2017**

## *One-day satellite transport workshop*

- 09:00 - 10:30 Finalize the Box-Cascade paper
- 10:30 - 11:00 Coffee break
- 11:00 - 12:00 Update of Box-Vlasov results
- 12:00 - 13:30 Lunch
- 13:30 - 14:30 Update of Box-Vlasov results
- 14:30 - 16:30 Update of Box-Pion results
- 16:30 - 17:00 Coffee break
- 17:00 - 18:00 Future activities of transport comparison project