

# SCIENTIFIC PROGRAM FOR FUSION08

Monday, September 22

**Chair:** David Hinde (Australian National University, Canberra, Australia)

09:15-09:30 **Welcome address:** Robert Janssens (Argonne National Laboratory, Argonne, IL, USA)

## - Heavy-ion fusion -

09:30-10:00 Alberto Stefanini (INFN, Laboratori Nazionali di Legnaro, Legnaro, Italy)  
*Heavy-ion Fusion near and below the Coulomb Barrier: New Results*

10:00-10:30 Mahananda Dasgupta (Australian National University, Canberra, Australia)  
*Towards a Consistent Understanding of Near-barrier Reactions*

10:30-11:00 Kouichi Hagino (Tohoku University, Sendai, Japan)  
*Fusion at deep subbarrier energies: potential inversion revisited*

11:00-11:20 Șerban Mișicu (NIPHE-HH, Bucharest Magurele, Romania)  
*Role of N-N Density-Dependent Forces in Folding Calculations at Energies Well Below the Coulomb Barrier*

11:20-11:40 Takatoshi Ichikawa (RIKEN Nishina Center, RIKEN, Japan)  
*Existence of One-Body Barrier Revealed in Deep Sub-Barrier Fusion*

11:40-12:00 Giovanna Montagnoli (University of Padova, Italy)  
*Fusion of  $^{36}\text{S}+^{48}\text{Ca}$  near and below the Coulomb Barrier*

12:00-14:00 Lunch break

**Chair:** Alejandro Szanto de Toledo (Universidade de São Paulo, Brazil)

14:00-14:30 Alexis Diaz-Torres (Australian National University, Canberra, Australia)  
*Effects of Quantum Decoherence on Heavy-ion Fusion within a new Coupled Channels Approach*

14:30-14:50 Matias Rodriguez (Australian National University, Canberra, Australia)  
*Highly Precise Excitation Functions and Distributions of Barriers for the Systems  $^{58}\text{Ni} + ^{58,60,64}\text{Ni}$*

14:50-15:10 Michael Carpenter (Argonne National Laboratory, Argonne, IL, USA)  
*Studies of Neutron-Deficient Nuclei Near the  $Z=82$  Shell Closure via Cold Fusion Reactions*

15:10-15:30 Jean-Pierre Wieleczko (GANIL - Caen, France)  
*Influence of  $N/Z$  on disintegration modes of compound nuclei*

15:30-16:00 Coffee break

**Chair:** Romualdo de Souza (Indiana University, Bloomington, Indiana, USA)

16:00-16:20 Kouhei Washiyama (GANIL - Caen, France)  
*Extraction of Nucleus-Nucleus Potential and Energy Dissipation from Dynamical Mean-field Theory*

16:20-16:40 Raj K Gupta (Panjab University, India)  
*Dynamical Model for the Decay of Hot and Rotating Compound Nuclei*

**- Fusion reactions in nuclear astrophysics -**

16:40-17:10 David J. Jenkins (University of York, UK)  
*Indirect Nuclear Physics Techniques for Studying Nova Nucleosynthesis*

## Tuesday, September 23

### - Heavy-ion Reactions -

**Chair:** Giovanna Montagnoli (University of Padova, Italy)

08:30-09:00 Suzana Szilner (Ruder Boskovic Inst., Zagreb, Croatia)

*Quasi-elastic reactions: a survey of recent results with PRISMA-CLARA*

09:00-9:30 Rafal Broda (Polish Academy of Sciences, Kraków, Poland)

*Spectroscopy with Deep-Inelastic HI Reactions - Harvest of Today and Perspective of Tomorrow*

09:30-09:45 Wojtek Królas (Polish Academy of Sciences, Kraków Poland)

*Heavy-ion Deep-Inelastic Collisions Studied by Discrete Gamma-Ray Spectroscopy*

09:45-10:00 Enrico Fioretto (INFN, Laboratori Nazionali di Legnaro, Legnaro, Italy)

*The magnetic spectrometer PRISMA combined with large  $\gamma$  arrays*

10:00-10:30 Coffee break

**Chair** Stephen Landowne (United States Military Academy, West Point, NY, USA)

10:30-11:00 Giovanni Pollarolo (Università di Torino and INFN, Torino, Italy)

*The Many Facets of Grazing Reactions*

11:00-11:20 Maurits Evers (The Australian National University, Canberra, Australia)

*Systematic Study of the nuclear potential through high precision back-angle quasielastic scattering measurements of  $^{16}\text{O}$  and  $^{32}\text{S}$  on various targets*

11:20-11:40 Juan Huiza (Universidade de São Paulo, Brazil)

*Reaction Coupled Channels Calculations in the  $^{18}\text{O}+^{64}\text{Zn}$  System*

11:40-12:00 Shinichi Mitsuoka (Japan Atomic Energy Agency, Ibaraki, Japan)

*Barrier Distribution of Quasi-elastic Backward Scattering of  $^{48}\text{Ti}$ ,  $^{54}\text{Cr}$ ,  $^{56}\text{Fe}$ ,  $^{64}\text{Ni}$ ,  $^{70}\text{Zn}$  and  $^{86}\text{Kr}$  on  $^{208}\text{Pb}$*

12:00-14:00 Lunch break (Tuesday)

**Chair:** Mahananda Dasgupta (Australian National University, Canberra, Australia)

14:00-14:20 Denis Lacroix (GANIL - Caen, France)  
*Stochastic Mean-field Dynamics*

14:20-14:40 James Broomfield (University of Surrey, UK)  
*Mass Distributions beyond Time-dependent Hartree-Fock*

14:40-15:00 Dirceu Pereira (Universidade de São Paulo, Brazil)  
*A Parameter-free Imaginary Potential for Dissipative Processes in Heavy-ion Reactions*

**- Fusion reactions in nuclear astrophysics -**

15:00-15:30 Cheng Lie Jiang (Argonne National Laboratory, Argonne, IL, USA)  
*Heavy-ion Fusion Hindrance and its Implications on Astrophysics*

15:30-16:00 Coffee break

**Chair:** Mahir Hussein (Universidade de São Paulo, Brazil)

16:00-16:30 Kate Jones (University of Tennessee, USA)  
*Studies of Nuclei Close to  $^{132}\text{Sn}$  Using Single-neutron Transfer Reactions*

16:30-17:00 Jirohta Kasagi (Tohoku University, Sendai, Japan)  
*Electronic and Ionic Screening for Low-Energy Nuclear Reactions in Condensed Matter*

17:00-17:15 Hye Young Lee (Argonne National Laboratory, Argonne, IL, USA)  
 *$^{12}\text{B}(n,\gamma)$  - The Influence of  $r$ -process Nucleosynthesis of Light Elements*

17:15-17:30 Catherine Deibel (JINA, Joint Institute for Nuclear Astrophysics, MSU and ANL)  
*Toward an Experimentally Determined  $^{26}\text{mAl}(p,\gamma)^{27}\text{Si}$  Reaction Rate in ONe Novae*

## Wednesday, September 24

### - Fusion Reactions in Nuclear Astrophysics -

**Chair:** Ernst Rehm (Argonne National Laboratory, Argonne, IL, USA)

08:30-09:00 Marialuisa Aliotta (University of Edinburgh, UK)

*Fusion Reactions in Stars: What News from the Lab?*

09:00-09:30 Michael Wiescher (University of Notre Dame, IN, USA)

*Thermonuclear and Pycnonuclear Fusion Processes in Nuclear Astrophysics*

09:30-9:45 Nidhi R Patel (Colorado School of Mines, Golden, CO, USA)

*Experiments to Further the Understanding of the Triple-Alpha Process in Hot Astrophysical Scenarios*

09:45-10:05 Sandrine Courtin (University Louis Pasteur, Strasbourg, France)

*A New Decay Path in the  $^{12}\text{C}+^{16}\text{O}$  Radiative Capture Reaction*

10:05-10:30 Coffee break

### - Cluster Effects in Nuclear Reactions -

**Chair:** Russell Betts (University of Illinois, Chicago, USA)

10:30-11:00 Martin Freer (University of Birmingham, UK)

*Dilute Nuclear States*

11:00-11:30 Florent Haas (IPHC and University Louis Pasteur, Strasbourg, France)

*Clusters in Heavy-Ion Resonant Reactions*

11:30-11:50 Christian Beck (Institut Pluridisciplinaire Hubert Curien, Strasbourg, France)

*Reaction mechanisms in  $^{24}\text{Mg} + ^{12}\text{C}$  collisions*

11:50-12:10 Vladilen Goldberg (Cyclotron Institute, Texas A&M, College Station, TX, USA)

*$\alpha$ -cluster structure in light  $N \neq Z$  nuclei*

12:10-14:00 Lunch break (Wednesday)

**Chair:** Christian Beck (Institut Pluridisciplinaire Hubert Curien, Strasbourg, France)

14:00-14:20 Vladir Guimaraes (Universidade São Paulo, Brazil)

*Cluster spectroscopic investigation of  ${}^7\text{Be}$  and  ${}^7\text{Li}$  by the  ${}^3\text{He}({}^7\text{Be}, {}^3\text{He}){}^7\text{Be}$  and  ${}^4\text{He}({}^7\text{Li}, {}^4\text{He}){}^7\text{Li}$  elastic transfer reactions*

14:20-14:40 Jozsef Cseh (Hungarian Academy of Sciences, Debrecen, Hungary)

*Resonances, Clusters and Deformation*

14:40-15:00 Makoto Ito (RIKEN Nishina Center, RIKEN, Japan)

*Unified studies of the exotic structures of  ${}^{10,12}\text{Be}$  and the  $\alpha+{}^{6,8}\text{He}$  reactions*

### - Fusion with unstable nuclei -

15:00-15:30 James J. Kolata (University of Notre Dame, IN, USA)

*Total Reaction Cross Sections for  ${}^8\text{B}+{}^{58}\text{Ni}$  near the Coulomb Barrier*

15:30-16:00 Coffee break

**Chair:** Felix Liang (Oak Ridge National Laboratory, USA)

16:00-16:30 Dan Shapira (Oak Ridge National Laboratory, USA)

*Using radioactive ion beams to investigate the effect of neutron excess on the fusion of heavy nuclei*

16:30-16:50 Eli Aguilera (Instituto Nacional de Investigaciones Nucleares, México)

*Fusion of  ${}^8\text{Li}+{}^{208}\text{Pb}$*

16:50-17:10 Pierpaolo Figuera (Laboratori Nazionali del Sud, INFN, Catania, Italy)

*${}^{9,10,11}\text{Be}+{}^{64}\text{Zn}$  Reaction Studies at the Coulomb Barrier*

17:10-17:30 Sergey Krupko (Flerov Laboratory of Nuclear Reactions, JINR, Dubna, Russia)

*Complete and Incomplete Fusion of  ${}^6\text{He}$  and  ${}^6\text{Li}$  Projectiles Interacting with Medium Mass Targets at  $E \approx 10$  AMeV*

## Thursday, September 25

### - Fusion with unstable nuclei -

**Chair:** Navin Alahari (GANIL - Caen, France)

08:30-09:00 Riccardo Raabe (GANIL - Caen, France)

*Transfer and breakup of light weakly-bound nuclei*

09:00-09:20 Antoine Lemasson (GANIL - Caen, France)

*Reactions with the double Borromean nucleus  $^8\text{He}$  near the Coulomb barrier*

09:20-09:40 Andrea Vitturi (Dip.to di Fisica Galileo Galilei and INFN, Univ. of Padova, Italy)

*Role of the Continuum in Reactions with Weakly Bound Systems*

09:40-10:00 Paulo Gomes (Universidade Federal Fluminense, Niterói, Brazil)

*Disentangling Static and Dynamical Effects of Low Breakup Threshold in Fusion Reactions with Weakly Bound Nuclei*

10:00-10:30 Coffee break

**Chair:** Fernando Scarlassara (Università di Padova and INFN, Italy)

10:30-10:50 Basants Nayak (Bhabha Atomic Research Centre, Mumbai, India)

*Effects of  $N=40$  Shell Closure on Fusion Barrier Distributions in  $^{18}\text{O}+^{58,62}\text{Ni}$  Reactions*

10:50-11:10 Alejandro Szanto de Toledo (Universidade de São Paulo, Brazil)

*Reaction Mechanisms induced by Weakly Bound Nuclei: Study of the  $^6\text{Li}+^{59}\text{Co}$  System*

11:10-11:30 Alberto Pacheco (TANDAR, Argentina)

*Exclusive Measurements of Breakup Reactions in the  $^7\text{Li}+^{144}\text{Sm}$  System*

11:30-11:50 Marco Mazzocco (Dipartimento di Fisica and INFN, Università di Padova, Italy)

*RIBs for reaction studies: the EXOTIC project at LNL*

- Fission -

**Chair:** Birger Back (Argonne National Laboratory, Argonne, IL, USA)

11:50-12:20 David Hinde (Australian National University, Canberra, Australia)  
*Fission and Quasi-fission*

12:20-12:40 Katsuhisa Nishio (Japan Atomic Energy Agency, Ibaraki, Japan)  
*Effects of nuclear orientation on fission mass distributions  
in the reactions of  $^{34,36}\text{S} + ^{238}\text{U}$*

12:40-13:00 Gulzar Singh (Panjab University, Chandigarh, India)  
*Pre-fission neutron emission of  $^{19}\text{F} + ^{209}\text{Bi}$  reaction*

18:30-22:00 **Banquet and cruise**

**Friday, September 26**

- Heavy and super-heavy nuclei -

**Chair:** John Schiffer (Argonne National Laboratory, Argonne, IL, USA)

08:30-09:00 Dieter Ackermann (GSI, Darmstadt, Germany)  
*The Quest of Superheavy Elements - Formation, Survival, and Structure Properties*

09:00-09:20 Yoritaka Iwata (University of Tokyo, Hongo, Tokyo, Japan)  
*Reduced charge equilibration in heavy-ion collisions at higher energy and synthesis of  
neutron-rich nuclei*

09:20-09:40 Teng Lek Khoo (Argonne National Laboratory, Argonne, IL, USA)  
*Superheavy nuclei: Structure, Magic Gaps & Tests of Theory*

09:40-10:00 Jing Qian (Yale University, New Haven, CT, USA)  
*Decay study of  $^{257}\text{Rf}$*

10:00-10:30 Coffee break

10:30-10:50 Ichiro Nishinaka (Japan Atomic Energy Agency, Ibaraki, Japan)  
*Nuclear-charge polarization at scission in proton-induced fission of light actinides*

10:50-11:30 Lorenzo Corradi (INFN, Laboratori Nazionali di Legnaro, Legnaro, Italy)  
*Summary talk*