

# **International Workshop on Nuclear Dynamics and Thermodynamics**

**in Honor of Prof. Joe Natowitz**

**Texas A&M University, College Station, Texas, USA**

**August 19-22, 2013**

**Workshop site: Stephen Hawking Auditorium, Physics Building, Texas A&M University**

## **Scientific Program and Schedule of Events**

### **Monday, Aug. 19**

**8:30-9:00 Registration (sign in, pick up your name tag and the workshop program)**

#### **9:00-10:10am: Opening Session**

**Session Chair: Robert Tribble, Texas A&M University, USA**

9:00-9:05am: Welcome and Remarks, H. Joseph Newton, Dean of the College of Science, TAMU

9:05-9:10am: Welcome and Remarks, Dr. R. Bowen Loftin, President of Texas A&M University

9:10-9:25am: Joe's Career and Current Status of Research in Nuclear Science at TAMU,  
Robert Tribble, TAMU

9:25-9:40am: A Brief History of Nuclear Chemistry at TAMU, Sherry Yennello, TAMU

9:40-10:10am, Why Nuclear Science was and is Still so Interesting to Me, Joe Natowitz, TAMU

10:10-10:30am, Coffee Break

**(All talks in the following are 20+5 minutes)**

#### **10:30-12:10noon: Correlation and clustering in nuclei and nuclear reactions**

**Session Chair: Sherry Yennello, Texas A&M University, USA**

10:30-10:55am: Lee Sobotka, Washington University, St. Louis, USA

Exotic dancing on the bridge between driplines

10:55-11:20am: Marina Barbui, Texas A&M University

Exploring the alpha cluster structure of nuclei using the thick target inverse kinematics technique for multiple alpha decays

11:20-11:45am: Daniela Fabris, INFN Sezione di Padova, Italy

Pre-equilibrium alpha-particle emission as a probe of alpha-clustering in nuclei

11:45-12:10pm: Anna Unzhakova, St. Petersburg State University, Russia

Fission potential energy calculations for collinear cluster tripartition

12:10-1:30pm, Lunch in the Lobby of the Physics Building

### **1:30-3:10pm: Nuclear Temperature**

**Session Chair: Aldo Bonasera, Texas A&M University, USA**

1:30-1:55pm: Wolfgang Bauer, Michigan State University, USA

Nuclear temperature

1:55-2:20pm: Hua Zheng, Texas A&M University

Coulomb correction of the temperature and density determined from quantum fluctuations

2:20-2:45pm: Justin Mabila, Texas A&M University, USA

Experimental results on critical densities and temperatures from quantum fluctuations

2:45-3:10pm: Feng-Shou Zhang, Beijing Normal University, China

Determining nuclear temperature in heavy-ion collisions

3:10-3:30pm, Coffee Break

### **3:30-5:35pm: New Facilities and Detectors**

**Session Chair: Stephen Steadman, MIT, USA**

3:30-3:55am: When-Qing Shen, Shanghai Institute of Applied Physics, China

New facilities for nuclear physics and application of nuclear technology in China

3:55-4:20am: Livius Trache, IFIN-HH Bucharest, Romania

ELI-NP, a new European facility

4:20-4:45am: Gianfranco Prete, INFN-Legnaro, Italy

SPES: the Legnaro RIB facility

4:45-5:10pm: Greg Chubarian, Texas A&M University

Rare Isotope Beam Facility at the TAMU Cyclotron Institute (Project T-REX)

5:10pm-5:35: Fabiana Gramegna, INFN - Laboratori Nazionali di Legnaro, Italy

Neutron detectors: new detectors, innovative materials and new algorithms for Pulse Shape Discrimination

6:00-7:30pm, Reception and Tour of the Cyclotron Institute

## **Tuesday, Aug 20**

### **8:30am-12:10pm: Nuclear Reaction Dynamics from Low to Intermediate Energies**

**Session Chair: Katarzyna Schmidt, University of Silesia, Poland**

8:30-8:55pm: Udo W. Schroeder, University of Rochester, USA

Proximity splitting and frustrated massive transfer in medium-energy heavy-ion reactions

8:55-9:20pm: Eric SURAUD, LPT-IRSAMC, France

On dissipation in quantum mean field dynamics

9:20-9:45pm: Xiaodong Tang, University of Notre Dame, USA

The  $^{12}\text{C}+^{12}\text{C}$  fusion reaction at stellar energies

9:45-10:10pm: Bill Lynch, Michigan State University, USA

Probing the isospin dependence of nucleon effective mass with heavy-ion reactions

10:10-10:30am, Coffee Break

**Tuesday, Aug 20**

**10:30-12:10noon: Thermodynamics of Hot Nuclei and Nuclear Matter**

**Session Chair: René Roy, Université Laval, Canada**

10:30-10:55am: Romualdo de Souza, Indiana University, USA

Fusing exotic nuclei below the barrier

10:55-11:20am: Jan Toke, University of Rochester, USA

Spinodal vaporization - an overlooked prompt decay mode of highly excited nuclei and its familiar experimental telltale

11:20-11:45am: Roy Wada, Institute of Modern Physics, China

Experimental reconstruction of primary hot fragments

11:45-12:10pm: Claudio Dorso, Universidad de Buenos Aires, Argentina

Nuclear pasta?

**12:10-1:30pm, Lunch in the Lobby of the Physics Building**

**1:30-3:10pm: Multi-facets of Nuclear Science**

**Session Chair: John Hardy, Texas A&M University, USA**

1:30-1:55pm: Michel GONIN, Ecole Polytechnique, France

Review on neutrino oscillations

1:55-2:20pm: Bao-An Li, Texas A&M University-Commerce

Review on probing nuclear symmetry energy with nuclear reactions

2:20-2:45pm: William G. Newton, Texas A&M University-Commerce, USA

Review on impacts of nuclear symmetry energy on properties of neutron stars

2:45-3:10pm: Yixiao Luo, Vanderbilt University/LBNL

New insight into the nuclear structure of n-rich Pd and Ru isotopes

**3:10-3:30pm, Coffee Break**

**3:30-5:10pm: Equation of State of Uniform and Clustered Matter**

**Session Chair: Rainer Fries, Texas A&M University, USA**

3:30-3:55pm: Shalom Shlomo, Texas A&M University, USA

Modern energy density functional

3:55-4:20pm: Farrukh Fattoyev, Texas A&M University-Commerce, USA

EOS of neutron-rich matter within the Relativistic Mean-Field approach

4:20-4:45pm: Gerd Roepke, University of Rostock, Germany

The Mott effect

4:45-5:10pm: Kris Hagel, Texas A&M University, USA

Experimental determination of Mott points in nuclear matter

**7:00- 10:00PM (Come and go) After dinner - dessert open house at Karin & Joe's House  
709 Honeysuckle Lane, College Station**

**Wednesday, Aug. 21**

**(Start earlier!)**

**8:05-10:10am: Dynamics and Thermodynamics of Relativistic Heavy-Ion Collisions**

**Session Chair: Che Ming Ko, Texas A&M University, USA**

8:05-8:30am: Joe Kapusta, University of Minnesota, USA

Equations of State with a chiral critical point

8:30-8:55am: Charles Gale, McGill University, Canada

Electromagnetic radiation from high-energy heavy-ion collisions

8:55-9:20am: Scott Pratt, Michigan State University, USA

Chemistry of the Quark Gluon Plasma

9:20-9:45am: Marcus Benghi Pinto, Federal University of Santa Catarina (UFSC), Brazil

Magnetized hot and dense quark matter

9:45-10:10am: Bin Zhang, Arkansas State University, USA

Dynamics of a microcosm: parton transport and the Quark-Gluon Plasma

10:10-10:30am, **Coffee Break**

**10:30-12:10pm: Relativistic Heavy-Ion Experiments**

**Session Chair: Gary Westfall, Michigan State University, USA**

10:30-10:55am: Roy Lacey, Stony Brook University, USA

Beam energy dependence of the viscous damping of anisotropic flow

10:55-11:20am: Flemming Videbaek, Brookhaven National Laboratory, USA

Reaction dynamics in Relativistic Heavy-Ion Collisions at RHIC

11:20-11:45am: Michael Murray, University of Kansas, USA

Heavy-ion results from CMS

11:45-12:10pm: Seweryn Kowalski, University of Silesia, Poland

NA61/SHINE experiment at the CERN SPS

12:10-1:30pm, **Lunch in the Lobby of the Physics Building**

**Wednesday, Aug. 21**

**1:30-3:10pm: Theories/Probing the Density Dependence of Nuclear Symmetry Energy**

**Session Chair: Bao-An Li, Texas A&M University-Commerce, USA**

1:30-1:55pm: Lie-Wen Chen, Shanghai Jiao Tong University, China

The density curvature parameter and high density behavior of the symmetry energy

1:55-2:20pm: Pawel Danielewicz, Michigan State University, USA

Constraints on the symmetry energy

2:20-2:45pm: Wei-Zhou Jiang, Southeast University, China

Symmetry energy with non-nucleonic degrees of freedom

2:45-3:10pm: Jorge Piekarewicz, Florida State University, USA

Constraints on the symmetry energy from measurements of neutron skins at JLAB

3:10-3:30pm, **Coffee Break**

**Wednesday, Aug. 21**

**3:30-5:10pm: Experiments/Probing the Density Dependence of Nuclear Symmetry Energy**

**Session Chair: Neil Nambodiri, Lawrence Livermore National Laboratory, USA**

3:30-3:55pm: Betty Tsang, Michigan State University, USA

Probing the Equation of State of neutron-rich matter

3:55-4:20pm: Wolfgang Trautmann, GSI, Germany

Probing nuclear symmetry energy with nucleon collective flow

4:20-4:45pm: Giuseppe Verde, INFN-Catania, Italy

Space-time and correlation probes of dynamics and AsyEos

4:45-5:10pm: Abdou Chbihi, Ganil, France

Exploring the symmetry energy with the  $^{40,48}\text{Ca}+^{40,48}\text{Ca}$  systems.

**Workshop picture will be taken before the banquet**

**6:30-8:30pm, Banquet, place: Lobby of the Physics Building**

**Thursday, Aug. 22**

**8:30-10:10am: Applications of Nuclear Science and Technology**

**Session Chair: Christian Ngo, France**

8:30-8:55am: Ferid Haddad, Universite de Nantes, France

Radionuclide production at ARRONAX

8:55-9:20am: María-Ester Brandan, Instituto de Física, UNAM, Mexico

Radiation dosimetry with TAMU beams

9:20-9:45am: Arturo Menchaca-Rocha, Instituto de Física, UNAM, Mexico

Coalescence of liquid drops by surface tension

9:45-10:10am: Matteo Barbarino, Texas A&M University, USA

Optimizing densities and temperatures of plasmas for nuclear physics using lasers

**10:10-10:30am, Coffee Break**

**10:30-12:10noon: Isospin Effects in Nuclear Reactions**

**Session Chair: Wolfgang Trautmann, GSI, Germany**

10:30-10:55am: Jun Xu, Shanghai Institute of Applied Physics, China

Spin-isospin effects in intermediate-energy heavy-ion collisions

10:55-11:20am: Alan McIntosh, Texas A&M University, USA

The influence of neutron-proton asymmetry on nuclear temperature

11:20-11:45am: George Souliotis, Univ. of Athens, Greece and TAMU

Studies of N/Z equilibration via heavy-residue isoscaling

11:45-12:10pm: Marco Mazzocco, University of Padova, Italy

Reaction dynamics studies for the system  $^7\text{Be} + ^{58}\text{Ni}$  at near-barrier energies

**12:10-1:30pm, Lunch in the Lobby of the Physics Building**

**Thursday, Aug. 22**

**1:30-3:35pm: Synthesis of Superheavy Elements**

**Session Chair: Vlad Goldberg, Texas A&M University**

1:30-1:55pm: Walter Loveland, Oregon State University, USA

New synthetic paths to n-rich heavy nuclei

1:55-2:20pm: Dmitriy Mayorov, Texas A&M University, USA

Influence of projectiles with  $Z > 20$  on synthesis of heavy evaporation residues

2:20-2:45pm: Tyler Werke, Texas A&M University, USA

Excitation functions of  $^{45}\text{Sc}$ -induced reactions: towards superheavy elements synthesis

2:45-3:10pm: Zbigniew Majka, Jagiellonian University, Poland

Experimental search for super and hyper heavy nuclei in TAMU cyclotron

3:10-3:35 Charles Folden, Texas A&M University, USA

Prospects for the discovery of the next new element in complete-fusion reactions

**Closing: Joe Natowitz**