

N08-TNET, website:
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First TNET Workshop

The first TNET workshop “Theory Network for Nuclear Structure and Reactions” was held at the University of Surrey, Guildford (United Kingdom) during part of Monday 10th, as well as Tuesday and Wednesday the 11-12 of April 2006.

The organizing committee was composed of Ian Thompson (Surrey, coordinator), Jan Vaagen (Bergen) and Antonio Fonseca (Lisbon).

The main goal of the workshop was to bring together the nuclear theorists in the TNET from around Europe so that they could be acquainted with recent developments in nuclear theory, be informed about new experimental developments, and discuss the consequences of the future needs in both theoretical and experimental work.

A total of 35 nuclear theorists, experimentalists, observers and students attended the Workshop, from 11 EC and Associated States countries. The meeting followed immediately the Town Meeting for NT* that was held on the Monday, and most participants attended both meetings. Some of the TNET review talks were delivered during the Town Meeting in order to broaden the audience and provide more general feedback for our own group.

The detailed programmes for the workshop and the overlapping parts of the Town Meeting are given in Annex 1. The workshop talks (pdf files) can be browsed from the TNET webpage <http://www.nucleartheory.net/tnet/Workshop06-presentations.htm>. A complete list of participants and a summary of the workshop are also given in Annex 1.

First TNET Workshop / ANNEX 1

1. List of Participants

Giuseppina Orlandini, U. Trento; Winfried Leidemann, U. Trento; Pierre Capel, Brussels/ Triumpf; Pierre Descouvemont, Brussels; Helmut Leeb, TU Wien; Michele Viviani, Pisa; Reiner Krücken, München; Jan Vaagen, Bergen; Oyvind Jensen, Bergen; J. Gomez Camacho, Sevilla; Curro Pérez Bernal, Huelva; Antonio Moro, Sevilla; Niels Walet, Manchester; Massimo Alvioli, Perugia; Sarmistha Banik, Manchester; Marek Ploszajczak, GANIL; David Dean, Oslo/ORNL; Nguyen Van Giai, Orsay; Antonio Fonseca, Lisboa; M. Rodriguez Gallardo, Lisboa; Ian Thompson, Jeff Tostevin, Jim Al-Khalili, Christine Carter, Amy Bartlett, Ron Johnson, Wilton Catford, Bill Gelletly, Surrey; Ramon Wyss, Stockholm; Jose Udias, Madrid; Tamas Vertse, Debrecen; Marielle Chartier, Liverpool; Roy Lemmon, Daresbury; Philippe Chomaz, GANIL; and Robert Roth, Darmstadt.

2. Workshop Programme (including part of preceding Town Meeting)

Monday			
10.20am	Ian Thompson	Surrey	Challenges in Reaction theory
11.30am	David Dean	Oslo/ORNL	Challenges on low-energy nuclear theory
12.15pm	Helmut Leeb	Wien	Application relevant reaction calculations needs and requirements
2.00pm	Philippe Chomaz	GANIL	The Physics programme at SPIRAL2
Tuesday			
9.00am	Ian Thompson	Surrey	Welcome & Introduction
9.15am	Marielle Chartier	Liverpool	Exotic Nuclei studied in light-ion induced reactions at the future NESR storage ring
9.45am	Robert Roth	Darmstadt	Nuclear Structure and Reactions with Correlated Realistic NN-Potentials
11.00am	Michele Viviani	Pisa	Few-nucleon reactions and the nuclear interaction
11.30am	Reiner Krücken	München	AIC and other NUSTAR activities
12.00noon	Jan Vaagen	Bergen	Need for Phenomenology
2.00pm	Francisco Pérez Bernal	Huelva	Continuum Discretization and Coulomb Breakup. Application of the THO Formalism
2.30pm	Antonio Moro	Sevilla	Interplay between breakup and transfer to the continuum
3.00pm	Massimo Alvioli	Perugia	A realistic many-body approach to high-energy scattering processes off complex nuclei
4.00pm	Elias Khan	Orsay	Two neutrons transfer close to the drip-line
4.30pm	Joaquin Gomez Camacho	Sevilla	Scattering of exotic nuclei around the coulomb barrier: Experiments and theory
5.00pm	Discussion		

Wednesday			
9.15am	Roy Lemmon	Daresbury	Reactions with relativistic radioactive beams
9.45am	Pierre Capel	Brussels/ Triumf	Breakup of halo nuclei within a Dynamical Eikonal Model
11.00pm	Antonio Fonseca	Lisboa	p-d elastic scattering and breakup
11.30am	David Dean	ORNL	Coupled-cluster theory approaches to nuclei
12.00noon	Manuela Rodriguez Gallardo	Lisboa	Structure and reactions of ^6He
2.00pm	Giuseppina Orlandini	U. Trento	EM probes for the study of light nuclei
2.30pm	Christine Carter	Surrey	Knockout reactions
3.00pm	Ramon Wyss	Stockholm	Critical remarks on the spin orbit interaction in mean field models
3.30pm	Niels Walet	Manchester	Hard-core truncated CCM; Correlations and high energy scattering

3. Summary of the Workshop, by the Coordinator

What this workshop showed is that there is a considerable range of nuclear theory work being performed throughout the Europe, in particular in the countries participating in this Workshop. I show below the ‘call for contributions’, and the experimental contributions explained these new requirements for theory at a broad level, but still most of the theoretical contributions showed less a concerted effort than the particular work the individual groups have been developing.

There are some future possibilities revealed at the Workshop. The ‘Few Body’ theoretical community has been focusing up to now on few nucleon problems, but there are good prospects for applying their methods to heavy nuclei, using either in-medium interactions or cluster approximations. The disparity between the languages of the mean-field structure researchers and the reaction theorists was also demonstrated, and this indicates a further need for workshops such as this one to bring together the different research groups so that their efforts may be connected and more universal theories developed. More work is clearly needed in order to establish an ‘integrated infrastructure’ in the field of theoretical nuclear physics.

4. Initial ‘Call for Contributions’

The scientific programme of the TNET part of the meeting (Tuesday am to Wed pm) will be directed toward the theory that will be useful and new European facilities such as FAIR at GSI and SPIRAL2 at GANIL. The experiments will often be at 100-1000 MeV/u. To this end, the following topics need to be addressed:

- Short-range correlations in nuclei
- Shell effects far from stability
- Knockout & stripping reactions
- Off-shell and/or finite-range effects in knockout reactions

- Improving impulse approximations
- Breakup reactions
- Charge-exchange reactions
- Meson (etc) production & exchange currents
- Polarisation - in any of the above reactions
- Comparing exclusive & inclusive reactions at intermediate energies

Although some of the above topics are not the 'expertise' at the universities, we would still be interested very much in hearing thoughts on these questions. This is not a general nuclear physics conference at which there is talk about what each group has done in the recent years, but one that looks forward to what can/will be needed and done in the future.