Spin Networks in Atomic and Molecular Physics, Quantum Chemistry and Quantum Computing

June 27, 2011 to June 29, 2011
Location: CECAM-ETHZ, Zurich, Switzerland
Map of the ETH Honggerberg campus

Day 1 - June, 27th 2011

Introduction (V. Aquilanti)
- 09:00 to 09:20 - Welcome

Session 1, Chair V. Aquilanti
- 09:20 to 10:05 - Jesus Sánchez Dehesa
  Entropy and complexity measures of D-dimensional systems with some atomic and molecular applications

Break
- 10:05 to 10:25 - Coffee Break

Session 2, Chair R. Littlejohn
- 10:25 to 11:10 - Roger Anderson
  Some 3nj Symbols and their q-extensions: Orthogonal polynomials in one, two, and three discrete variables
- 11:10 to 11:55 - Mauro Carfora
  Polymerization of quantum geometries
- 11:55 to 14:00 - Lunch Break

Session 3, Chair A. Marzuoli
- 14:00 to 14:45 - Aron Kuppermann
  The delightful properties of row-orthonormal hyperspherical coordinates for studying polyatomic systems
- 14:45 to 15:30 - Cecilia Coletti
  Coulomb Sturmians and Hyperspherical Harmonics as atomic and molecular orbitals

Break
- 15:30 to 15:50 - Coffee Break

Session 4, Chair R. Anderson
- 15:50 to 17:00 - Annalisa Marzuoli
  Spin networks, quantum computing and automata (tutorial)

Day 2 - June, 28th 2011

Session 1, Chair O. Vasyutinskii
- 08:45 to 09:30 - Robert Littlejohn
  Semiclassical Mechanics of the Wigner 9j Symbol
- 09:30 to 10:15 - Simona Cavalli
  Three-body reaction dynamics using generalized angular momentum states

Break
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<tr>
<td>10:15 to 10:35</td>
<td>Coffee Break</td>
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<td>Session 2, Chair O. Roncero</td>
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| 10:35 to 11:20 | Jonathan Connor  
Local angular momentum-local impact parameter analysis: A new tool for understanding the dynamics of atomic, molecular and nuclear heavy-ion collisions |
| 11:20 to 12:05 | Oleg Vasyutinskii  
Angular momentum polarization in the products of photodissociation and reaction collisions |
| 12:05 to 14:00 | Lunch Break                                                         |
| Communications and panel discussions |
| 14:00 to 14:15 | Vincenzo Aquilanti  
Introduction |
| 14:15 to 14:45 | Pablo Sanchez-Moreno  
Entropies of discrete orthogonal polynomials and applications |
| 14:45 to 15:15 | Roland van der Veen  
Asymptotic expansions for spin network evaluations |
| Break         |                                                                  |
| 15:15 to 15:35 | Coffee Break                                                        |
| Comments, addenda, discussion |
| 15:35 to 15:50 | Danilo Calderini  
Hydrogenoid orbitals revisited: from Slater orbitals to Coulomb Sturmians |
| 15:50 to 16:05 | Federico Palazzetti  
Spherical and Hyperspherical Harmonics in the Representation of the Potential Energy Surfaces. |
| 16:05 to 16:20 | Patricia Regina Pereira Barreto  
Tetra-atomic and penta-atomic systems in the hyperspherical representation |
| 16:20 to 16:35 | Mirco Ragni  
Quantum Spin Networks and their Applications: Illustration of Classical and Non-Classical Borderlines |
| 16:35 to 16:50 | Ana Carla Peixoto Bitencourt  
Discrete orthogonal basis sets in quantum chemistry: applications to large amplitude umbrella modes |
| 16:50 to 17:30 | Discussion                                                          |
| Social Dinner |

**Day 3 - June, 29th 2011**

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<th>Time</th>
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| 08:45 to 09:30 | Gerrit C. Groenenboom  
Electronic interaction anisotropy between atoms in arbitrary angular momentum states |
| 09:30 to 10:15 | Octavio Roncero  
Quantum stereodynamics of Li+HF reactive collisions: the role of reactants polarization on the differential cross section |
| Break         |                                                                  |
| 10:15 to 10:35 | Coffee Break                                                        |
| Session 2, Chair G. Groenenboom |
| 10:35 to 11:20 | Dimitris Skouteris  
A treatment of the confined H atom using a multiconfiguration time-dependent Hartree method |
| 11:20 to 12:05 | Dario de Fazio  
Hyperspherical method in reaction dynamics: perspectives of ab-initio quantum reactive scattering calculations |
| 12:05 to 14:00 | Lunch Break                                                         |
| Session 3, Chair M. Carfora |
| 14:00 to 14:45 | Hal M. Haggard  
Discrete Volume of Space via Bohr-Sommerfeld Quantization |
| 14:45 to 15:30 | Andrea Lombardi  
Hyperspherical coordinates in classical mechanics and applications |
| 15:30 to 16:00 | Closing word                                                        |