Transition States for Multielectron Ionization Phenomena

Fact Sheet

Project Information

TRANS-MI

Grant agreement ID: 294974

Project closed

Start date
1 May 2012

End date
30 April 2016

Funded under
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 119 700,00

EU contribution
€ 81 900,00

Coordinated by
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
France

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Objective

"Probing atomic or molecular systems with ultrashort and near-optical lasers remains a tremendous challenge while their understanding exerts a significant impact on science and industry by enabling a series of cutting-edge techniques: the production of lasers with ever shorter wavelengths by high harmonic generation, analysis by laser induced electron diffraction, and orbital tomography, to quote just a few applications. This new field of physics and engineering, ""attosecond science"", investigates the motion of the electrons on their own time the time scale of motion. These laser-driven systems are perfect for the investigation of both quantum and classical approaches. The results obtained using both frameworks can be compared with actual up-to-date experimental results which are currently pursued world-wide. The project we are proposing concerns the classical mechanical treatment, which has been recognized as surprisingly accurate since the early 90’s because of the dominant role of electron correlation. The main advantage of the classical mechanical approximation is the power-law scaling of its representation with system size, compared with the exponential increase of complexity of quantum mechanics.
Our objective is to apply tools from chemical physics describing chemical reactions using transition state theory (a key element of chemical reaction theory) to sub-atomic processes involving a strong electron-electron correlation as encountered in attosecond science.
The project aims at linking mathematicians, physicists and chemists to build a unified theoretical framework to tackle the complex dynamics in laser-matter interactions.
The proposed collaborative project will be coordinated by the Center for Theoretical Physics (CNRS) in Marseille (France) and will involve the School of Mathematics of the Loughborough University (UK), as well as the School of Physics and the School of Chemistry at the Georgia Institute of Technology (USA)."

Fields of science (EuroSciVoc)

natural sciences > physical sciences > **quantum physics**

natural sciences > physical sciences > **molecular and chemical physics**

natural sciences > **chemical sciences**

natural sciences > physical sciences > optics > **laser physics**

natural sciences > physical sciences > **theoretical physics**

Programme(s)

FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

FP7-PEOPLE-2011-IRSES - Marie Curie Action "International Research Staff Exchange Scheme"

Call for proposal

FP7-PEOPLE-2011-IRSES
See other projects for this call

Funding Scheme

MC-IRSES - International research staff exchange scheme (IRSES)

Coordinator

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

EU contribution

€ 52 500,00

Total cost

No data

Address

RUE MICHEL ANGE 3
75794 Paris

France

Region

Ile-de-France > Ile-de-France > Hauts-de-Seine

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Participants (2)

LOUGHBOROUGH UNIVERSITY

United Kingdom

EU contribution

€ 16 800,00

Address

ASHBY ROAD
LE11 3TU Loughborough

Region

East Midlands (England) > Leicestershire, Rutland and Northamptonshire > Leicestershire CC and Rutland

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

UNIVERSIDAD POLITECNICA DE MADRID

Spain

EU contribution

€ 12 600,00

Address

CALLE RAMIRO DE MAEZTU 7 EDIFICIO RECTORADO
28040 Madrid

Region

Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

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