

# Institutional Collaborations

## Accelerator Developments:

National Institute of Radiological Sciences, Chiba, Japan

## All-XUV Pump-Probe Transient Absorption Spectroscopy of the Structural Molecular Dynamics of Di-iodomethane:

Theoretische Chemie, Universität Heidelberg, Germany

Physikalisches Institut, Westfälische Wilhelms-Universität Münster, Germany

FLASH/DESY, Hamburg, Germany

Theoretische Chemie, Universität Heidelberg, Germany

ELI-ALPS, Szeged, Hungary

Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore

Paul-Scherrer-Institut, Villigen, Switzerland

Laboratorium für Physikalische Chemie, ETH Zürich, Switzerland

SLAC National Accelerator Laboratory, Menlo Park (CA), USA

Department of Chemistry, University of California, Berkeley (CA), USA

Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley (CA), USA

## Attosecond Delay Lines and HHG Control:

Max-Planck Institute for Physics of Complex Systems, Dresden, Germany

Indian Institute of Science Education and Research (IISER) Mohali, Punjab, India

## Attosecond pulse shaping with dense gas:

Argonne National Laboratory, Lemont (IL), USA

LCLS / SLAC National Accelerator Laboratory, Menlo Park (CA), USA

Louisiana State University, Baton Rouge (LA), USA

## Attosecond Real-Time Observation of Recolliding Electron Trajectories in Helium at Low Laser Intensities:

Université Paris-Saclay, CNRS, LPTMS, Orsay, France

Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany

## Attosecond transient absorption of a continuum threshold:

Department of Physics and Astronomy, Drake University, Des Moines (IA), USA

## Attosecond XUV + NIR experiments resolved in Reaction microscopes:

University of Freiburg, Germany

ELI-ALPS Szeged, Hungary

## BASE:

GSI, Germany

University of Hannover, Germany

University of Mainz, Germany

Helmholtz-Institut Mainz, Germany

PTB, Germany

CERN, Switzerland

RIKEN, Japan

University of Tokyo, Japan

## Coherent X-ray 4-wave mixing near core- and inner-shell resonances:

Paul-Scherrer-Institut, Villigen, Switzerland

Institut für Angewandte Physik, Universität Bern, Switzerland

## Coherent X-ray–optical control of nuclear excitons:

ESRF, Grenoble, France

DESY, Hamburg, Germany

Helmholtz-Institut Jena, Germany

GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Germany

Institut für Optik und Quantenelektronik, Friedrich-Schiller-Universität Jena, Germany

## COLLAPS:

KU Leuven, Belgium

Beijing University, China

IPNO, IN2P3 Paris, France

TU Darmstadt, Germany

Universität Mainz, Germany

CERN Geneva, Switzerland

University of Manchester, UK  
University of Liverpool, UK

**CONUS:**

PreussenElektra GmbH, Kernkraftwerk Brokdorf, Brokdorf, Germany  
including a multiple scientific cooperation with:  
Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

**Core-resonance line-shape analysis of atoms undergoing strong-field ionization:**

Centre for Theoretical Atomic, Molecular and Optical Physics, School of Mathematics and Physics, Queen's University Belfast,  
Northern Ireland, United Kingdom

**Cryogenic Experiments on Trapped Molecular and Cluster Ions:**

Universität Innsbruck, Austria  
Heyrovský Institute of Physical Chemistry, Czechia  
Universität Greifswald, Germany  
TU Kaiserslautern, Germany  
Weizmann Institute of Science, Rehovot, Israel  
Bar Ilan University, Ramat Gan, Israel

**Cryogenic Multi-Pixel Microcalorimeters for Molecular Fragments:**

Universität Heidelberg, Germany

**Cryogenic Storage Ring:**

Université Catholique de Louvain-La-Neuve, Belgium  
Universität Greifswald, Germany  
Universität Giessen, Germany  
TU Kaiserslautern, Germany  
Weizmann Institute of Science, Rehovot, Israel  
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**Dielectronic recombination of atomic ions:**

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**Differential Measurement of Electron Ejection after Two-Photon Two-Electron Excitation of Helium:**

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**Gamma-rays from Molecular Clouds:**

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PDINFN, INFN Padova, Padua, Italy  
ALNGS, INFN Laboratori Nazionali del Gran Sasso, Assergi, Italy  
LNGS, INFN Laboratori Nazionali del Gran Sasso and Gran Sasso Science Institute, Assergi, Italy  
LNGSAQU, INFN Laboratori Nazionali del Gran Sasso and Università degli Studi dell'Aquila, L'Aquila, Italy  
CAT, INFN Laboratori Nazionali del Sud, Catania, Italy  
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MIBF, Dipartimento di Fisica, Università Milano Bicocca, Milan, Italy  
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INMR, Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia  
ITEP, Institute for Theoretical and Experimental Physics, NRC "Kurchatov Institute", Moscow, Russia  
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LLR, Laboratoire Leprince-Ringuet, Ecole Polytechnique, CNRS/IN2P3, Palaiseau, France  
LPNHE, Laboratoire de Physique Nucléaire et de Hautes Energies, CNRS, Sorbonne Universités, UPMC Université de Paris, France  
Paris 06, Université Paris Diderot, Sorbonne, Paris Cité, France  
LUPM, Laboratoire Univers et Particules de Montpellier, Université Montpellier, CNRS/IN2P3, Montpellier, France  
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ICN-UNAM, Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México, Mexico City, Mexico  
IF-UNAM, Instituto de Física, Universidad Nacional Autónoma de México, Mexico City, Mexico  
IGEF-UNAM, Instituto de Geofísica, Universidad Nacional Autónoma de México, Mexico City, Mexico  
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**HHG in LCs:**

Politecnico di Milano

**High performance electron beam ion traps and sources:**

TRIUMF, Vancouver, Canada  
Fudan University, Shanghai, China  
Michigan State University, USA

**High repetition rates XUV table top sources:**

VENTEON - Laser Quantum Company, Hannover, Germany  
Leibniz Universität Hannover, Germany  
Universität Heidelberg, Germany  
Lund University, Sweden

**HITRAP:**

TU Wien, Austria  
GANIL Caen, France  
GSI Darmstadt, Germany  
Universität Mainz, Germany  
KVI Groningen, The Netherlands  
Jagellonian University Cracow, Poland  
University of Stockholm, Sweden  
Imperial College London, UK

**Intermolecular Coulombic decay in organic molecular dimers:**

Physikalisch-Chemisches Institut, Universität Heidelberg, Germany

**Investigations of interaction processes between ionizing radiation and matter using reaction microscopes:**

Physikalisch Technische Bundesanstalt (PTB) Braunschweig, Germany

**Invisibles EU FP7 ITN:**

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Ferrara University, Italy

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**Laser Control of Electronic Exchange Interaction within a Molecule:**

Institut für Theoretische Physik, Universität Heidelberg, Germany

**Laser-induced electron diffraction (LIED) coincidence measurements with reaction microscopes:**

ICFO Barcelona, Spain

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INFN Sezione di Milano, Milano, Italy  
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Institute for Scintillation Materials, Kharkiv, Ukraine  
Taras Schevchenko University of Kyiv, Faculty of Physics, Kyiv, Ukraine

**Low frequency dynamics in LCs:**

Ljubljana University  
Radboud University  
Durham University

**Mapping Resonance Structures in Transient Core-Ionized Atoms:**

European XFEL, Schenefeld, Germany  
Physikalisches Institut, Universität Kassel, Germany  
Institut für Experimentalphysik, Universität Hamburg, Germany  
DESY, Hamburg, Germany  
Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia  
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Department of Physics and Astronomy, Drake University, Des Moines (IA), USA

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Universität Erlangen, Germany  
GSI Darmstadt, Germany  
Universität Mainz, Germany  
Universität Gießen, Germany  
Universität München, Germany  
Variable Energy Cyclotron Centre Kolkata, India  
Raniganj Girls' College, India  
St. Petersburg Nuclear Physics Institute, Russia  
St. Petersburg State University, Russia  
Universidad de Huelva, Spain  
University of Granada, Spain  
University of Valencia CSIC, Spain  
CIEMAT, Spain  
UPC, Spain  
Stockholm University, Sweden  
CERN Geneva, Switzerland  
Lawrence Livermore National Laboratory, USA  
Michigan State University, USA  
Louisiana State University, USA

**Measuring the frequency chirp of extreme-ultraviolet free-electron laser pulses by transient absorption spectroscopy:**

Physikalisches Institut, Westfälische Wilhelms-Universität Münster, Germany  
FLASH/DESY, Hamburg, Germany  
Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore  
Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore  
Laboratorium für Physikalische Chemie, ETH Zürich, Switzerland  
Department of Chemistry, University of California, Berkeley (CA), USA

**Nonlinear Coherence Effects in Transient-Absorption Ion Spectroscopy with Stochastic Extreme-Ultraviolet Free-Electron Laser Pulses:**

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ETH Zürich, Switzerland  
UC Berkeley, USA

**Nuclear Experiments in storage rings:**

Centre Etudes Nucléaires de Bordeaux Gradignan, France

**NUSTAR:**

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IRES Strasbourg, France  
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CSNSM Orsay, France  
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Universität Mainz, Germany  
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**Optical clocks:**

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**Phase shifts due to continuum couplings:**

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**Photocathodes for Cold Intense Electron Beams:**

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**Probing ultrafast coherent dynamics in core-excited xenon by using attosecond XUV-NIR transient absorption spectroscopy:**

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Gesellschaft für Schwerionenphysik GmbH (GSI), Darmstadt, Germany  
Hochschule für Technik und Wirtschaft Berlin (HTW), Berlin, Germany  
Johannes-Gutenberg-Universität Mainz, Mainz, Germany  
Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany  
Leibniz-Institut für Astrophysik Potsdam (AIP), Potsdam, Germany  
Ludwig-Maximilians-Universität München (LMU), München, Germany  
Max-Planck-Institut für Radioastronomie (MPIfR), Bonn, Germany

Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany  
Rupprecht-Karls-Universität Heidelberg, Heidelberg, Germany  
Thüringer Landessternwarte (TLS), Tautenburg, Germany  
Technische Universität Dortmund, Dortmund, Germany  
Technische Universität Dresden, Dresden, Germany  
Universität Bielefeld, Bielefeld, Germany  
Universität Hamburg, Hamburg, Germany  
Universität Regensburg, Regensburg, Germany  
Albert-Ludwigs-Universität Freiburg, Freiburg, Germany  
Bergische Universität Wuppertal, Wuppertal, Germany  
Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany  
Deutsche Physikalische Gesellschaft (DPG), Bad Honnef, Germany  
Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Rossendorf, Germany  
Hochschule Darmstadt, Darmstadt, Germany  
Humboldt-Universität zu Berlin, Berlin, Germany  
Goethe-Universität Frankfurt, Frankfurt, Germany  
Leibniz-Institut für Sonnenphysik (KIS), Freiburg, Germany  
Leibniz Rechenzentrum (lrz), Garching b. München, Germany  
Max Planck Computing and Data Facility (MPCDF), Garching b. München, Germany  
Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany  
Ruhr-Universität Bochum, Bochum, Germany  
RWTH Aachen University, Aachen, Germany  
Technische Informationsbibliothek – Leibniz Information Centre for Science and Technology University Library (TIB), Hannover, Germany  
Technische Universität Darmstadt, Darmstadt, Germany  
Technische Universität München, München, Germany  
Universität Potsdam, Potsdam, Germany  
Universität Siegen, Siegen, Germany  
Universität zu Köln, Köln, Germany  
Verein für datenintensive Radioastronomie e.V., Bonn, Germany  
Westfälische Wilhelms-Universität Münster, Münster, Germany  
European Organization for Nuclear Research (CERN), Geneva, Switzerland

**Radiative Emission from Trapped Polyatomic Molecules:**

Max-Planck-Institut für Astronomie, Germany  
Karlsruhe Institute of Technology, Germany

**Real-Time Reconstruction of the Strong-Field-Driven Dipole Response:**

Vienna University of Technology, Vienna, Austria

**REMI Experiments at FLASH:**

Aarhus University, Denmark  
Sorbonne University Paris, France  
MPIPKS Dresden, Germany  
DESY Hamburg, Germany  
University Madrid, Spain  
Lund University, Sweden  
University of Connecticut, USA  
Kansas State University Manhattan, KS, USA

**Resolving Vibrations in a Polyatomic Molecule with Femtometer Precision:**

Institut für Theoretische Physik, Universität Heidelberg, Germany

**Resonant Perfect Absorption Yielded by Zero-Area Pulses:**

School of Nuclear Science and Technology and Frontiers Science Center for Rare Isotopes, Lanzhou University, China  
Institut für Optik und Quantenelektronik, Friedrich-Schiller-Universität Jena, Germany  
Department of Physics and Astronomy, Louisiana State University, Baton Rouge (LA), USA

**SFB Isolated quantum systems and universality in extreme conditions:**

Heidelberg University, Germany

**SHIPTRAP:**

GSI Darmstadt, Germany  
TU Darmstadt, Germany  
Helmholtz-Institut Mainz, Germany  
Universität Mainz, Germany  
Universität Greifswald, Germany  
Universität Gießen, Germany  
LMU München, Germany

St. Petersburg Nuclear Physics Institute Gatchina, Russia  
Universidad Granada, Spain

**SPARC:**

Centro Atomico Bariloche, Argentina  
TU Wien, Austria  
TRIUMF National Laboratory Vancouver, Canada  
University of Manitoba Winnipeg, Canada  
York University Toronto, Canada  
Institute of Modern Physics, Chinese Academy of Sciences, China  
China Institute of Atomic Energy Beijing, China  
Institute of Applied Physics and Computational Mathematics Beijing, China  
Fudan University Shanghai, China  
Institute of Modern Physics Lanzhou, China  
Jilin University, China  
Lanzhou University, China  
University of Science and Technology of China Hefei, China  
Wuhan Institute of Physics and Mathematics, China  
Northwest Normal University Lanzhou, China  
Ruder Boskovic Institute Zagreb, Croatia  
Institute of Physics, Czech Academy of Sciences, Czech Republic  
University of Aarhus, Denmark  
Cairo University Beni-Suef, Egypt  
Institut des NanoSciences de Paris, France  
Laboratoire Kastler-Brossel Paris (UPMC/ENS), France  
CIMAP Caen, France  
CIRIL-Ganil Caen, France  
Ecole Normale Supérieure Lyon, France  
Institut de Physique Nucléaire de Lyon, France  
Groupe de Physique des Solides Paris, France  
Deutsches Elektronen-Synchrotron DESY, Germany  
Humboldt-Universität Berlin, Germany  
Hahn-Meitner-Institut Berlin, Germany  
Universität Jena, Germany  
Universität Greifswald, Germany  
Forschungszentrum Jülich, Germany  
Universität Freiburg, Germany  
GSI Darmstadt, Germany  
Universität Gießen, Germany  
TU München, Germany  
LMU München, Germany  
TU Dresden, Germany  
Universität Tübingen, Germany  
Universität Frankfurt am Main, Germany  
Universität Mainz, Germany  
Universität Kassel, Germany  
TU Clausthal, Germany  
Universität Heidelberg, Germany  
TU Darmstadt, Germany  
PTB Braunschweig, Germany  
Universität Erlangen, Germany  
University of Crete and IESL-FORTH Heraklion, Greece  
Institute of Nuclear Research Debrecen, Hungary  
Tata Institute of Fundamental Research Mumbai, India  
Vaish College Rohtak, India  
Nuclear Science Centre New Delhi, India  
Bhabha Atomic Research Centre Mumbai, India  
INFN Catania, Italy  
University of Tokyo, Japan  
RIKEN Wako, Japan  
Hashemite University Zarqa, Jordan  
Universidad Nacional Autónoma de México Cuernavaca, Mexico  
Reijksuniversiteit Groningen, The Netherlands  
B Z University Multan, Pakistan  
Instituto Peruano de Energía Nuclear, Peru  
Swietokrzyska Academy Kielce, Poland

Jagellonian University Cracow, Poland  
Warsaw University, Poland  
Institute of Nuclear Physics of Polish Academy of Sciences Cracow, Poland  
The Soltan Institute for Nuclear Studies Swierk, Poland  
Universidade de Lisboa, Portugal  
National Institute for Laser, Plasma & Radiation Physics, Romania  
Institute for Space Sciences – INFLPR, Romania  
National Institute for Physics and Nuclear Engineering Bucharest, Romania  
RRC “Kurchatov Institute”, Russia  
Petersburg Nuclear Physics Institute, Russia  
Lebedev Physical Institute Moscow, Russia  
St. Petersburg State University, Russia  
Institute of Metrology for Time and Space Mendelevoo, Russia  
Institute of Spectroscopy of the RAS Troitsk, Russia  
Moscow State University, Russia  
V.G. Khlopin Radium Institute St. Petersburg, Russia  
Institute of Physics Belgrade, Serbia and Montenegro  
UNED – Universidad a Distancia, Spain  
CIMAT, Spain  
Hospital Universitario La Paz, Spain  
University of Madrid, Spain  
CSIC Madrid, Spain  
Chalmers University of Technology and Göteborg University, Sweden  
Stockholm University, Sweden  
Mid-Sweden University Sundsvall, Sweden  
Lund University, Sweden  
Manne Siegbahn Laboratory Stockholm, Sweden  
CERN Geneva, Switzerland  
University of Fribourg, Switzerland  
Universität Basel, Switzerland  
Queen's University Belfast, UK  
University of Durham, UK  
Old Dominion University, USA  
East Carolina University, USA  
Lawrence Livermore National Laboratory, USA  
Kansas State University, USA  
Lawrence Berkeley National Laboratory, USA  
Georgia State University Atlanta, USA  
University of Missouri Rolla, USA  
Oak Ridge National Laboratory, USA  
Western Michigan University Kalamazoo, USA  
Harvard-Smithsonian Center for Astrophysics Cambridge, USA  
Brown University Providence, USA  
University of Texas Austin, USA  
Columbia University New York, USA  
Heat Physics Department of the Uzbek Academy of Sciences, Uzbekistan

**Spectral narrowing of x-ray pulses for precision spectroscopy with nuclear resonances:**

ESRF, Grenoble, France  
PETRAIII, DESY Hamburg, Germany

**Spectroscopy of highly charged ions for EUV nanolithography:**

Advanced Research Center for Nanolithography, EUV Plasma Processes, Amsterdam, The Netherlands

**Spectroscopy of pure and doped He-droplets:**

Aarhus University, Denmark

University of Freiburg, Germany

IITM Madras, India

**Stereo:**

IRFU, CEA, Université Paris-Saclay, 91191 Gif-sur-Yvette, France

Institut Laue-Langevin, CS 20156, 38042 Grenoble Cedex 9, France

Univ. Grenoble Alpes, Université Savoie Mont Blanc, CNRS/IN2P3, LAPP, 74000 Annecy, France

Univ. Grenoble Alpes, CNRS, Grenoble INP, LPSC-IN2P3, 38000 Grenoble, France

**Strong-Field XUV Dressing of Atomic Double Excitation:**

Shanghai Advanced Research Institute, Shanghai, China

European XFEL, Schenefeld, Germany

FLASH, DESY Hamburg, Germany  
PTB Braunschweig, Germany  
University of Crete and IESL-FORTH, Heraklion, Greece  
Nanyang Technological University, Singapore  
ETH Zürich, Switzerland  
UC Berkeley, USA

**SWGO:**

Instituto de Astronomía y Física del Espacio, IAFE, CONICET-UBA, Buenos Aires, Argentina  
Centro Atómico (CAB, CNEA) Bariloche, Argentina  
Facultad de Ciencias Exactas - Universidad Nacional de Salta (UNSa), Argentina  
Facultad de Ingeniera - Universidad Nacional de Salta (UNSa), Argentina  
Instituto de Física La Plata (IFLP, CONICET-UNLP), Argentina  
Instituto Argentino de Radioastronomía (IAR, CONICET-UNLP-CIC), Argentina  
CBPF, Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro, Brazil  
IFSC, Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos, Brazil  
IFF, Instituto Federal de Educação, Ciência e Tecnologia Fluminense, Rio de Janeiro, Brazil  
Universidad Metropolitana de Ciencias de la Educación, Chile  
CCTVal, Universidad Técnica Federico Santa María, Chile  
Centro de Astronomía, Universidad de Antofagasta, Chile  
Universidad Adolfo Ibáñez, Chile  
CCE, Universidad del Bío-Bío, Chile  
Institute of High Energy Physics, Chinese Academy of Science (IHEP,CAS), China  
GongTsunghua University, China  
Aerospace Information Research Institute, Chinese Academy of Science, China  
University of Science and Technology Beijing, China  
Hebei Normal University, China  
Ludong University, China  
Shandong University, China  
Nanjing University, China  
University of Science and Technology of China, China  
Tsung-Dao Lee Institute, Shanghai Jiao Tong University, China  
China University of Geosciences, China  
Sun Yat-Sen University, China  
University of Rijeka, Croatia  
FZU, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic  
ECAP, Erlangen Centre for Astroparticle Physics - Universität Erlangen-Nürnberg, Erlangen, Germany  
RWTH, Aachen, Germany  
Dipartimento di Fisica, Università degli studi di Torino, Italy  
Università di Padova, Dipartimento di Física e Astronomía & INFN Padova, Italy  
Dipartimento di Física e Astronomía "E. Majorana", Università di Catania, Italy  
Dipartimento di Física, Università di Trieste, Italy  
Politecnico di Milano, Italy  
Università degli Studi di Roma "Tor Vergata" - Dipartimento di Fisica, Italy  
Dipartimento Interateneo di Fisica dell'Università e del Politecnico di Bari, Italy  
INAF, Instituto Nazionale di Astrofísica, Italy  
IF-UNAM, Instituto de Física, Universidad Nacional Autónoma de México, Mexico City, Mexico  
IA-UNAM, Instituto de Astronomía, Mexico City, Mexico  
ICN-UNAM, Instituto de Ciencias Nucleares, Mexico City, Mexico  
IGEF-UNAM, Instituto de Geofísica, Mexico City, Mexico  
INAOE, Instituto Nacional de Astrofísica Óptica y Electrónica, Puebla, Mexico  
UNACH, Facultad de Ciencias en Física y Matemáticas, Chiapas, Mexico  
Benemérita Universidad Autónoma de Puebla, Mexico  
Universidad de Guadalajara, Mexico  
Universidad Michoacana de San Nicolás de Hidalgo, Mexico  
Centro de Investigación en Computación, Instituto Politécnico Nacional, Mexico  
Tecnológico de Monterrey, Mexico  
Universidad de Monterrey, Mexico  
UNSA, Universidad Nacional de San Agustín de Arequipa, Peru  
Pontificia Universidad Católica del Perú, Peru  
LIP, Laboratório de Instrumentação e Física Experimental de Partículas, Lisboa, Portugal  
Durham University, Durham, United Kingdom  
University Leicester, United Kingdom  
University of Oxford, United Kingdom  
Michigan Technological University, Houghton-MI, United States of America  
LNL, Los Alamos National Lab, Los Alamos-NM, United States of America

UMD, University of Maryland, College Park,-MD, United States of America  
WIPAC, Wisconsin IceCube Particle Astrophysics Center, UW-Madison, United States of America

**TCFS Center (Center for Time, Constants and Fundamental Symmetries):**

RIKEN, Japan  
Physikalisch-Technische Bundesanstalt, Germany  
Max-Planck-Institut für Quantenoptik, Germany

**TDYNO-Collaboration:**

Commissariat à l'énergie atomique et aux énergies alternatives (CEA), France  
Department of Physics, School of Natural Sciences, UNIST, Ulsan, Korea  
University of Oxford, UK  
Central Laser Facility, Rutherford Appleton Laboratories, STFC, UK  
Lawrence Livermore National Laboratory, USA  
Massachusetts Institute of Technology, Plasma Science and Fusion Centre, USA  
University of Rochester, LLE, USA  
University of Chicago, USA

**ThoriumNuclearClock:**

Technische Universität Wien, Austria  
Physikalisch-Technische Bundesanstalt, Braunschweig, Germany  
Ludwig-Maximilians-Universität München, Germany  
Fraunhofer-Institut für Lasertechnik, Aachen, Germany  
University of Delaware, Newark, DE, USA

**Time-Resolved sub-Ångström Metrology by Temporal Phase Interferometry near X-Ray Resonances of Nuclei:**

PETRAIII, DESY Hamburg, Germany  
The Hamburg Center for Ultrafast Imaging, Hamburg, Germany

**VHE Gamma-Ray Sources:**

University of Adelaide, Australia

**Watching the formation and reshaping of a Fano resonance in a macroscopic medium:**

School of Nuclear Science and Technology, Lanzhou University, China  
Institut für Optik und Quantenelektronik, Friedrich-Schiller-Universität Jena, Germany

**XENON Collaboration:**

NYUAD, Abu Dhabi  
Tsinghua University, China  
Subatech, France  
LPNHE, France  
LAL, France  
Johannes Gutenberg Universitaet Mainz, Germany  
Wilhelms-Universitaet Muenster, Germany  
Karlsruhe Institute of Technology, Germany  
University of Freiburg, Germany  
Weizmann Institute of Science, Israel  
University of L'Aquila, Italy  
Laboratori Nazionali del Gran Sasso, Italy  
University of Bologna and INFN-Bologna, Italy  
University of Torino and INFN-Torino, Italy  
University of Napoli and INFN-Napoli, Italy  
Kobe University, Japan  
Nagoya University, Japan  
University of Tokyo, Japan  
Nikhef and the University of Amsterdam, The Netherlands  
University of Coimbra, Portugal  
Stockholm University, Sweden  
University of Zurich, Switzerland  
Rice University, USA  
Purdue University, USA  
Columbia University, USA  
Rensselaer Polytechnic Institute, USA  
University of Chicago, USA  
University of California, San Diego, USA

**X-ray laboratory astrophysics with free-electron lasers and synchrotron radiation:**

IRAP Research Institute in Astrophysics and Planetology, Toulouse, France  
RIKEN Nishina Center, High Energy Astrophysics Laboratory, Saitama, Japan

Institute of Space and Astronautical Science, Tokyo, Japan  
Universidade Nova de Lisboa, Caparica, Portugal  
UNIST, School of Natural Science – Physics, Ulsan, South Korea  
Lawrence Livermore National Laboratory, Livermore, USA  
NASA Goddard Space Flight Center, USA

**X-ray transient absorption from the weak- to strong-field regime:**

European XFEL, Schenefeld, Germany  
Uppsala University, Sweden  
Argonne National Laboratory, Lemont (IL), USA  
Louisiana State University, Baton Rouge (LA), USA

**XUV pump – XUV probe transient absorption spectroscopy at FELs:**

Physikalisches Institut, Westfälische Wilhelms-Universität Münster, Germany  
FLASH/DESY, Hamburg, Germany Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore  
Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore  
Laboratorium für Physikalische Chemie, ETH Zürich, Switzerland

**XUV-FEL-pump – XUV-HHG-probe transient absorption spectroscopy of the dissociation dynamics of molecular oxygen (O<sub>2</sub>):**

Leibniz Universität Hannover, Germany  
FLASH/DESY, Hamburg, Germany  
CFEL/DESY, Hamburg, Germany  
Helmholtz-Institut Jena, Germany  
GSI Darmstadt, Germany  
Kansas State University, Manhattan (KS), USA

**XUV-Initiated Dissociation Dynamics of Molecular Oxygen (O<sub>2</sub>):**

Physikalisches Institut, Westfälische Wilhelms-Universität Münster, Germany  
FLASH/DESY, Hamburg, Germany  
Cabrini University, Radnor (PA), USA  
Kansas State University, Manhattan (KS), USA