

**– Thorsten Weber –
(Physicist, Ph.D.)**

CONTACT INFORMATION

Staff Scientist & affiliated Professor (AU)
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QUALIFICATION SUMMARY

Atomic Physicist with 18 years of experience in academia at universities and national and international research laboratories. Expertise in developing experimental and computational tools to read out and analyze complex multidimensional research data.

- **Productive independent researcher:** strong publication record in major journals
- **Pioneer in conducting kinematical complete experiments in molecular photo ionization:** developed and applied 3d-momentum imaging coincidence techniques to understand molecular dynamics, electron correlation, many body interactions, and structural properties of molecules
- **Strong communication and collaboration skills:** led own and other international teams of researchers in many projects at high ranking research facilities. Managed technicians and taught assistants and instructed students on science and safety issues.
- **Great experience in managing research groups and projects:** collaborated with colleagues (experiment and theory) to produce peer-reviewed publications and funding agencies review documents, conference presentations, internal reports and applications, as well as successful competitive grant proposals

INTERESTS

- **Professional:** R&D, project management, consulting, operation and manufacturing, safety, training and teaching, public relations
- **Hitherto research field:** Experimental Atomic, Molecular and Optical (AMO) physics & ultra fast AMO science, ultrafast dissociation and molecular reaction dynamics, femtosecond pump/probe experiments on polyene photoisomerizations that involve conical intersections, investigation of many particles systems and electron correlation in simple atoms and molecules

PERSONAL QUALIFICATIONS & VIGOROUSNESS

- **Personal amenities:** poise, self-confidence, pragmatic openness, tolerance, maximum commitment, creativity and autonomy, talent for organization and improvisation, project oriented thinking, reliability, conservative risk taking, attentive to details, ability to prioritize and manage multiple assignments simultaneously
- **Professional amenities:** achievements and experience in research and development, leading small and mid-sized work groups, working successfully in national and international collaborations, teaching skills, innovative and rigorous in solving experimental and/or scientific problems
- **Social amenities:** team-player and consent ready colleague, sociable with conversational partners of different hierarchies, nationalities and backgrounds, decisive, great stamina, highly committed, beginning high-level executive

PROFESSIONAL EXPERIENCE

- **Affiliated Professor**, Physics Department, Auburn University 2011 – present

- **Staff Scientist**, (S11.5), Chemical Sciences Division, Lawrence Berkeley National Laboratory 2011 – present
- **Divisional Fellow**, (S11.4), Chemical Sciences Division, Lawrence Berkeley National Laboratory 2006 – 2011
- **Leader of a Helmholtz Young Investigator Group**, DESY/Hamburg & Institut für Kernphysik/University Frankfurt/Germany 2005 – 2006
- **Postdoctoral Feodor Lynen Fellow**, (R 11.1), Alexander von Humboldt Foundation & Chemical Sciences Division, Lawrence Berkeley National Laboratory 2003 – 2005
- **Research Associate**, J.W. Goethe University Frankfurt/Germany 2001 – 2003

MANAGEMENT & TECHNICAL SKILLS

- **Responsibilities:** fundamental research in the fields of atomic and molecular physics with synchrotron radiation, and short laser pulses as well as with Free Electron Laser (FEL) light, establishing cooperation's with strategic national and international partners (Universities: Kansas, Auburn, Frankfurt. Industries: RoentDek), supervising and teaching Bachelor, Master and PhD students as well as postdoctoral Fellows
- **Finances:** project planning of several experiments with an average term of 5 years (in average 3 annual budgets from \$120k to \$1.4M). Design, development, and setup of two measuring apparatuses (\$300k each), continuous purchase of components at specified suppliers, preparation of quarterly reports for funding agencies and proposals for research facilities, securing of annual capital equipment
- **Competencies:** setup of autonomous research groups (3 to 6 appointees), recruitment, hiring and training, finances, choosing subject matters, technical and scientific steering of research projects, direct supervision of postdoctoral fellows and training of master and PhD students, team leader of 4 to 10 scientists in national and international projects, publication and PR
- **Engineering:** design, set-up, and commissioning of ultra high vacuum chambers, cryogenic- and vacuum techniques, supersonic gas jets, electron, ion and photon diagnostic tools and beam transport
- **Spectroscopy:** 3d-momentum imaging and position sensitive detector techniques, time of flight and mass spectrometry, photo electron and recoil ion spectroscopy, particle coincidence techniques, reaction microscopy of molecular dynamics
- **Electronics:** fast detector and CAMAC and NIM-electronics readout (nuclear scientific electronics and control units), particle spectroscopy/short-time metrology, particle accelerators controls
- **Computing:** set-up in hard- and software (data acquisition computers and work stations as well as file and web servers) and administration, fast electronics read-out, MS-Windows operating systems (2), MS-Office-applications (2), internet (php) (2), Auto-CAD (4), CorelDRAW (3), Fortran 90 (2), SIMION 3D (Simulation of electromagnetic fields) (3), PAW/LabView/COBOLD (event-mode data acquisition and analysis) (1), Microcal Origin (scientific data preparation) (1)

Rating: (very good) (good) (basics)

1 2 3 4 5 6

LABORATORY RESEARCH ACCOMPLISHMENTS

- **Scientific pioneering achievements:**
 - first experimental verification of the important re-scattering process in strong laser fields (publ. in Nature)
 - body fixed frame (so called MFPAD-KER and MFAAD-KER) spectroscopic analysis of small molecules (publ. inter alia in Science)
 - electron diffraction spectroscopy of fixed in space molecules illuminated from within (publ. inter alia in Science)
 - first experimental verification of the quasi-free photo double ionization mechanism (publ. in Phys. Rev. Lett.)
- **Technical developments and breakthroughs:**
 - design and use of novel (atom-molecule) hybrid 3d-momentum spectrometers
 - conception and proof of principle of a 3d-momentum streak camera
 - application of prototype multi-hit detectors in photoionization studies

LANGUAGE SKILLS

- **German:** native language
- **English:** business fluent in spoken and written
- **French:** proficiency in spoken and written

COMMUNICATION SKILLS

- **International Collaborations:** active participation in over 30 different research projects (Argentina, Austria, Canada, Germany, France, Italy, Japan, Switzerland, USA)
- **Project Leader:** more than 15-times at (non-home based) international research facilities like ALS, APS, BESSY II, CAB, CERN, DESY, FLASH, GANIL, GSI, NRC, SPring8
- **Presentations:** speaker and presenter at over 30 national and international conferences, workshops, countless formal and informal group and business meetings. Outreach to the community in open-house events: Organizer of the Chemical Sciences Division exhibition at LBNL 2010 and 2011, active participant at the Free Electron Laser Hamburg (Night of Science) 2006, and the Frankfurt University 1999 and 2003
- **Training:**
 - **BLI0116:** *Dynamic Research Talk I, 2010*
 - **BLI2023:** *Dynamic Research Talk II, 2011*

LEADERSHIP & SUPERVISING HISTORY

- **Laboratory Course Teaching Assistant:**
 - *Physics Labs for graduate students: 2 years at the University of Frankfurt*
- **Graduate and Postdoctoral Scholar Advisor:**
 - *Postdoctoral scholars: 3 LBNL, 1 DESY*
 - *PhD students: 3 LBNL, 1 DESY, 1 University of Frankfurt*
 - *Masters of Science students: 6 LBNL, 1 DESY, 3 University of Frankfurt*
 - *Bachelor of Science students: 2 LBNL*
 - *Summer students and interns: 5 LBNL, 2 University of Frankfurt*
- **Team Leader:**
 - *Own research groups: 4 – 6 students LBNL, 2 – 3 students DESY*
 - *National and international research projects: 4 – 10 students & scientists per project*
- **Leadership Training:**
 - **BLI0006:** *Roles & Account for New Supervisors, 2008*
 - **BLI0117:** *Supervisor Responsibilities at LBL, 2009*
 - **BLI0121:** *Leading & Motivating, 2008*
 - **BLI0122:** *Supervisor Scenarios - HR Issues, 2009*
 - **BLI0123:** *Leading Collaborative Team, 2009*
 - **BLI0128:** *Challenging People – Supervisor, 2010*
 - **BLI0130:** *Performance & Career Mentoring, 2009*
 - **BLI0148:** *Performance Review Workshop, 2010*
 - **BLI1067:** *I Was Trained to Do Everything but running a Lab, 2011*
 - **BLI1110:** *Strengthening Supervisor Capabilities, 2012*
 - **BLI1111:** *Unleash Employee Potential, 2012*
 - **BLI1112:** *Using Personal Power to Gain Control, 2012*
 - **BLI3003:** *Understanding Differences for Better Team Performance Part II (Personality Differences)*
- **Leadership Qualities (assessed via Leadership Development 360° survey, 2013):**
 - *Aware and compliant with rules and regulations, does consistently what he says he will do*
 - *High ethical standards, demonstrates moral excellence and firmness, can be counted on to do the right thing*
 - *Analyzes future scenarios to guide present day actions, converts goals into actions, monitors progress*
 - *Sees the best in people*
 - *Emphasizes the importance of safety*

EDUCATION

- Atomic Physics, Ph.D. (Dr. Phil. Nat. – summa cum laude):** University of Frankfurt, Germany 2003
- **Dissertation:** “Investigation of the entangled Motion of free Electron Pairs emitted from Single- and Double Well Coulomb Potentials in Photoionization Processes”, (“...the doctorate has been rated with excellent...”)
- Physics, M.S. (Dipl. Phys. – summa cum laude):** University of Frankfurt, Germany 1999
- **Thesis:** “Momentum Transfer in Proton-Helium collisions investigated with high resolution Recoil-ion Momentum Spectroscopy”, (“...passed with distinction because of brilliant achievement.”)
- Physics, B.S.:** University of Frankfurt, Germany 1994
- **Grade:** 2.0

AWARDS & FELLOWSHIPS

- **SPOT Award (safety)** for jointly developing the LBNL Area PPE Requirements Revision: a long, complex and challenging project with far-reaching effect 2013
- **SPOT Award (safety)** for jointly developing and implementing improved laboratory ergonomics in a collaboration between the LBNL Chemical Sciences Division and the Environmental Health Safety and Security group 2012
- **SPOT Award (outreach)** for excellent contribution and team spirit in representing the LBNL Chemical Sciences Division 2011
- **Certificate of Appreciation of the LBNL directorate** for preparing the critical lab wide Health, Safety & Security review for the Department of Energy 2010
- **Laboratory Directed Research and Development funds**, LBNL/Berkeley, \$120k/annum 2009 – 2011
- **Conrad-Wilhelm Röntgen Prize** of the Justus Liebig University Giessen/Germany, \$10k 2005
- **Grant for the formation of a young investigator group** at DESY/Hamburg in collaboration with the University of Frankfurt/Germany sponsored by the Helmholtz foundation, \$2.5M 2005
- **Feodor-Lynen-award of the Alexander von Humboldt foundation** for the promotion of autonomous research abroad, 2 years of postdoctoral salary 2003 – 2005
- **Scholarship** on the basis of the Hessian law for the promotion of procreation scientists, 2 years of graduate student salary 2000 – 2002

SYNERGISTIC ACTIVITIES

- **Grant Proposal Reviewer** of NSF, DOE and Research Corporation proposals
- **Reviewer of Manuscripts** submitted to Science, Nature, Optics Express, Review of Scientific Instruments, Journal of the American Chemical Society, Journal of Atomic, Molecular and Optical Physics B., Journal of Chemical Physics, New Journal of Physics, Modern Physics Letters B
- **PhD Examiner Board Member** at the Auburn University (2012 – present)
- **Poster Prize Committee** for the International Union of Pure and Applied Physics (IUPAP) at the International Symposium on (e,2e), Double Photoionization and Related Topics & 16th International Symposium on Polarization and Correlation in Electronic and Atomic Collisions (August 2011)
- **Safety:** Personal Protective Equipment (PPE) policy implementation subcommittee member (lab wide, LBNL/Berkeley, 2011), member of the chemical sciences safety manager search committee (LBNL/Berkeley, 2011), Building Emergency Team member (CERTified, LBNL/Berkeley, 2006 – present, Leader: 2012 – present), Laboratory Area Safety Leader (since 2006), hazardous waste contact person (since 2006), paramedic training and practice (civil service, Germany, 1991 – 1992), developer of laboratory ergonomics training course (2012), developer of small load lifting procedure (2013), developer of clear-the hallways program (2013)

SCIENTIFIC PUBLICATIONS

>100 papers in refereed journals including 2 Nature (2 first author), 3 Science, 1 Nature Phys., 25 Phys. Rev. Lett. (5 first/last author; one cited over 200 times).

• Selected Publications:

- 1. Th. Weber**, H. Giessen, M. Weckenbrock, G. Urbasch, A. Staudte, L. Spielberger, O. Jagutzki, V. Mergel, M. Vollmer, R. Dörner,
Correlated Electron Emission in Multiphoton Double Ionization,
Nature, **405**, (2000), 658
Times cited: >170
- 2. T. Weber**, A.O. Czasch, O. Jagutzki, A. K. Müller, V. Mergel, A. Kheifets, E. Rotenberg, G. Meigs, M.H. Prior, S. Daveau, A. Landers, C. L. Cocke, T. Osipov, R. Diez Muino, H. Schmidt-Böcking, R. Dörner,
Complete Photo-Fragmentation of the Deuterium Molecule,
Nature, **431**, (23 September 2004), p. 437-440
Times cited: >80
- 3. F. Martin**, J. Fernandez, T. Havermeier, L. Foucar, **Th. Weber**, K. Kreidi, M. Schöffler, L. Schmidt, T. Jahnke, O. Jagutzki, A. Czasch, E.P. Benis, T. Osipov, A.L. Landers, A. Belkacem, M.H. Prior, H. Schmidt-Böcking, C.L. Cocke, and R. Dörner,
Single Photon Induced Symmetry Breaking of H₂ Dissociation,
Science, **315**, (2007), 629 – 633
Times cited: >50
- 4. D. Akoury**, K. Kreidi, T. Jahnke, **Th. Weber**, A. Staudte, M. Schöffler, N. Neumann, J. Titze, L.Ph.H. Schmidt, A. Czasch, O. Jagutzki, R. A. Costa Fraga, R.E. Grisenti, R. Díez Muiño, N.A. Cherepkov, S. K. Semenov, P. Ranitovic, C.L. Cocke, T. Osipov, H. Adaniya, J. C. Thompson, M. H. Prior, A. Belkacem, A.L. Landers, H. Schmidt-Böcking, R. Dörner,
The Simplest Double Slit: Interference and Entanglement in Double Photoionization of H₂,
Science, **318**, (2007), 949 – 952
Times cited: >40
- 5. M.S. Schöffler**, J. Titze, N. Petridis, T. Jahnke, K. Cole, L. Ph. H. Schmidt, A. Czasch, D. Akoury, O. Jagutzki, J.B. Williams, N.A. Cherepkov, S.K. Semenov, C.W. McCurdy, T.N. Rescigno, C.L. Cocke, T. Osipov, S. Lee, M.H. Prior, A. Belkacem, A.L. Landers, H. Schmidt-Böcking, **Th. Weber**, R. Dörner,
Ultrafast Probing of Core Hole Localization in N₂,
Science Vol. **320**. no. 5878, (2008), 920 – 923
Times cited: >40
- 6. M.S. Schoeffler**, C. Stuck, M. Waitz, F. Trinter, T. Jahnke, U. Lenz, M. Jones, A. Belkacem, A. Landers, C. L. Cocke, J. Colgan, A. Kheifets, I. Bray, H. Schmidt-Boecking, R. Doerner, and **Th. Weber**
Ejection of quasi free electron pairs from the helium atom ground state by a single photon
Phys. Rev. Lett., **111**, (2013), 013003
Times cited: not cited yet

SCIENTIFIC PRESENTATIONS

Speaker and presenter at over 30 national and international conferences like ICPEAC (invited talk 2005), ISIAC (invited talk 2001), e2e (invited talk 2005, 2011), ECAMP (invited talk 2001), IWP (invited talk 2011), DAMOP, DPG, and X-ray at home and abroad

• Selected Presentations:

- 1. Th. Weber**, Kh. Khayyat, R. Doerner, V. Mergel, O. Jagutzki, L. Schmidt, F. Afaneh, A. Gonzalez, C.L. Cocke, A.L. Landers, and L. Cocke
Kinematically complete investigation of momentum transfer for single ionization in fast proton–helium collisions
16th international Conference on the Application of Accelerators in Research and Industry (CAARI), Denton, USA, November 2000
- 2. Th. Weber**, A. Czasch, A. Mueller, O. Jagutzki, T.Y. Osipov, A. Landers, M.H. Prior, J. Feagin, R. Doerner, C.L. Cocke and H. Schmidt-Boecking
Photo Double Ionization of Hydrogen Molecules investigated with the COLTRIMS Technique
European Conference on Atomic and Molecular Physics (ECAMP) VII, Berlin, Germany April 2001
- 3. Th. Weber**, Kh. Khayyat, A. Mueller, O. Jagutzki, V. Mergel, M. Achler, V. Rodriguez, R. Doerner, and H. Schmidt-Boecking
Electron Capture to the Continuum in Proton-Helium Collisions – a new Structure in Momentum Space
International Symposium on Ion Atom Collisions (ISIAC), Ensenada, Mexico, July 2001
- 4. Th. Weber**, A. Czasch, A. Mueller, O. Jagutzki, T.Y. Osipov, A. Landers, M.H. Prior, J. Feagin, R. Doerner, C.L. Cocke and H. Schmidt-Boecking
Photo double ionization of H_2 resp. of D_2 - the correlated motion of electrons in a two center coulomb potential
Electron and Photon Impact Ionization and related topics (EPII), Metz, France, July 2002
- 5. Th. Weber**, A. Czasch, A. Mueller, T.Y. Osipov, A. Landers, M.H. Prior, A. Belkacem, M. Walter, J. Briggs, D. Diez Muino, A. Kheifets, I. Bray, J. Feagin R. Doerner, C.L. Cocke and H. Schmidt-Boecking
Emission of an Electron pair from single and two center Coulomb-potentials induced by Photoabsorbtion
International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC) XXIV, Rosario, Argentina, July 2005
- 6. Th. Weber**, D.A. Akoury, K. Kreidi, M.S. Schoeffler, A. Czasch, T. Jahnke, T.Y. Osipov, M.H. Prior, A. Belkacem, C.W. McCurdy, R. Diez Munio, R. Doerner and C.L. Cocke
Interference and Decoherence of Hydrogen Molecules
International Symposium on (e,2e), Double Photoionization and Related Topics, Koenigstein, Germany, August 2007
- 7. Th. Weber**, M.S. Schoeffler, J. Colgan, T. Jahnke, J. Titze, L.Ph.H. Schmidt, A. Landers, A. Belkacem, C.L. Cocke and R. Doerner
Photo Double Ionization of Helium Atoms beyond the Dipole Approximation
International Workshop on Photoionization (IWP), Las Vegas, USA, May 2011
International Symposium on (e,2e), Double Photoionization and Related Topics & 16th International Symposium on Polarization and Correlation in Electronic and Atomic Collisions, August 2011