

CURRICULUM VITAE

Dr. Kyriaki Kosma

Tel. +30 6974953508

Email: kosma@staff.teicrete.gr

Date of birth: 03-07-1982

Place of Birth: Thessaloniki, Greece

Citizenship: Greek, Cypriot

EDUCATION

October 2004 – July 2008:

Ph.D. in experimental physics: “UV-pump IR-probe spectroscopy of molecules with time-resolution reaching the 10-fs range”

Laboratory for Attosecond Physics, Max-Planck-Institute for Quantum Optics, Garching, and Ludwig-Maximilians-Universität, Munich, Germany

October 2000 – July 2004:

Degree in Physics (8.27/10)

Undergraduate studies, Physics Department, University of Ioannina, Greece

August 2003 – October 2003:

Project on design and construction of Cu/Co Nanowires

International Summer Student Program, Material Science group

GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Germany

WORK EXPERIENCE

February 2010 – August 2017:

Post-doctoral fellow

Institute of Electronic Structure and Laser

Foundation for Research and Technology – Hellas, Heraklion, Greece

August 2008 – January 2010:

Post-doctoral fellow

Laboratory for Free Clusters and Molecules

Max-Born-Institute for Nonlinear Optics and Short-pulse Spectroscopy, Berlin, Germany

Referee in international scientific journals:

Journal of Physics B: Atomic, Molecular & Optical Physics, Sensors, Optics Letters, Chemical Physics

Co-organization of Summer schools/ Workshops:

ATTOFEL Summer School, ATTOFEL Marie Curie Initial Training Network

Ultrafast Dynamics using ATTosecond and XUV Free Electron Laser Sources, Crete, Greece, 02 – 06 May 2011

OPTO-CH 2016 Training Workshop, Laser technologies for Cultural Heritage analysis, diagnostics and conservation, Heraklion, Greece, June 27- July 02, 2016

TEACHING

October 2013-January 2016:

Acoustics and Optics Laboratory, Department of Music Technology and Acoustics Engineering, School of Applied Sciences (Rethymnon), Technological & Educational Institute of Crete

October 2016 – January 2018:

Lectures on Optoacoustics, Department of Music Technology and Acoustics Engineering, School of Applied Sciences (Rethymnon), Technological & Educational Institute of Crete

RESEARCH FIELDS AND INTERESTS

Optical Physics/ Nonlinear Optics:

Ultrashort (femtosecond, $1 \text{ fs} = 10^{-15} \text{ sec}$) pulse generation in the near infrared (near-IR) and ultraviolet (UV and vacuum UV/ XUV) spectral regions of the order of 10 fs at 800 nm and 20 fs to 30 fs at 160 to 260 nm

Self-phase modulation in filamentation and spectral broadening/supercontinuum generation in noble gases (He, Ar), air and N_2

Harmonic/ High-order harmonic generation in noble gases, for applications in molecular pump-probe spectroscopy

Light-matter interactions/ Molecular Spectroscopy:

Femtosecond dynamics of photophysical and photochemical reactions of molecules in the gas phase after electronic excitation. Such processes include ultrafast photo-dissociations, isomerizations, and non radiative decays to the ground state.

Measurement of the transition times of excited molecular systems/ characterization of the intermediate electronic states and/ or structures of the system during the reaction.

Study of the evolution of the real-time dynamics of molecules with the pump-probe technique: (multi-photon) ionization at 800/ 400/ 200/ 90 nm (probe) after absorption in the UV/ VUV region (pump), and analysis of the corresponding mass and photoelectron spectra as a function of the delay time between the pump and the probe.

Processes and systems studied include the photo-dissociation of transition metal carbonyls $\text{M}(\text{CO})_6$, $\text{M} = \text{Cr}, \text{Mo}, \text{W}$ (elimination of one CO ligand after absorption in the region 267 to 360 nm), isomerisation of ethylene, C_2H_4 (and ethylene- d_4 , C_2D_4), after absorption at 162 nm and excitation in the $\pi\pi^*$ state, excited state dynamics and radiationless deactivation/ ring opening of cyclic organic compounds (cytosine tautomers $\text{C}_4\text{H}_5\text{N}_3\text{O}$, cyclohexadiene C_6H_8 , and cyclooctatriene C_8H_{10}), after absorption in the region 260 nm to 290 nm and population of the bright $\pi\pi^*$ state, ground-state rotational constants and fragmentation channels in carbon disulfide, CS_2 , by combining pump-probe spectroscopy with ground-state rotational alignment, photodissociation of O_2 , after absorption at 160 nm and population of the Schumann-Runge band.

Laser Metrology:

Digital Holographic Interferometry methods, for structural diagnostics of solids, detection of mechanical defects and material characterization.

Optical Fiber Technology:

Optical properties of fibers combined with microsphere resonators of different materials (polystyrene, BaTiO₃, 5 μm to 25 μm in diameter), integrated inside micro-structured optical fibers within isolated or coupled schemes of two or more resonators. Analysis of Whispering Gallery Mode patterns in terms of Q-factors and intensity yields, resonant wavelength shifts, and mode splitting.

**SCHOLARSHIPS
DISTICTIONS**

2000 – 2003: Prize for best ratings for the academic years 1999-2000, 2000-2001, 2001-2002 Institute of National Fellowships (I.K.Y.), Greece

2000 – 2003: Undergraduate scholarship for the academic years 1999-2000, 2000-2001, 2001-2002 Institute of National Fellowships (I.K.Y.), Greece

**FUNDED
PROJECTS**

January 2014-December 2015:

IKY Fellowships of Excellence for Postgraduate Studies in Greece- Siemens Program: “Photonic devices of microstructured optical fibers with embedded spherical micro-resonators for sensor applications and optical switches”

LANGUAGES

Greek (native)

English (Cambridge Certificate of Proficiency in English, Level C2)

German (Goethe-Zertifikat Deutsch, Level B2)

**COMPUTER
SKILLS**

Origin, data analysis and graphics software

Mathematica, computational software program

Optiwave, design software for photonics

PUBLICATIONS IN INTERNATIONAL REFEREED JOURNALS

1. **Kyriaki Kosma**, Michalis Andrianakis, Kostas Hatzigiannakis and Vivi Tornari Digital Holographic Interferometry for Cultural Heritage structural diagnostics: a coherent and a low-coherence optical set-up for the study of a marquetry sample, *Strain*, 2018;e12263
2. **Kyriaki Kosma**, Kay Schuster, Jens Kobelke, and Stavros Pissadakis An “in-fiber” Whispering-Gallery-Mode bi-sphere resonator, sensitive to nanometric displacements, *App. Phys. B* 124 (2018) 1
3. Ioannis Konidakis, S. Psilodimitrakopoulos, **K. Kosma**, A. Lemonis, E. Stratakis, Effect of composition and temperature on the second harmonic generation in silver phosphate glasses, *Opt. Mat.* 75 (2018) 796
4. V. Tornari, M. Andrianakis, K. Hatzigiannakis, **K. Kosma**, V. Detalle, E. Bourguignon, D. Giovannacci, D. Brissaud Complementarity of digital holographic speckle pattern interferometry and simulated infrared thermography for Cultural Heritage structural diagnostic research, *International Journal of Engineering Research & Science* 34 (2016) 129
5. **Kyriaki Kosma**, Sergei A. Trushin, Werner Fuß, Wolfram E. Schmid, Branching and competition of ultrafast photochemical reactions of cyclooctatriene and bicyclooctadiene *Chem. Phys.* 463 (2015) 111
6. **Kyriaki Kosma**, Ioannis Konidakis, Stavros Pissadakis Photorefractive tuning of whispering gallery modes of a spherical resonator integrated inside a microstructured optical fibre *The European Phys. J.-Special Topics* 223 (2014) 2035
7. **Kyriaki Kosma**, Gianluigi Zito, Kay Schuster and Stavros Pissadakis Whispering gallery mode microsphere resonator integrated inside a microstructured optical fiber *Opt. Lett.* 38 (2013) 1301
8. Christian Schröter, **Kyriaki Kosma** and Thomas Schultz CRASY: Correlated Rotational Alignment Spectroscopy *Science* 333 (2011) 1011
9. **Kyriaki Kosma**, Sergei A. Trushin, Werner Fuß, Wolfram E. Schmid and Brigitte Schneider Photodissociation of group-6 hexacarbonyls: Observation of coherent oscillations in an antisymmetric (pseudorotation) vibration in Mo(CO)₅ and W(CO)₅ *Phys. Chem. Chem. Phys.* 12 (2010) 13197
10. **Kyriaki Kosma**, Christian Schröter, Elena Samoylova, Ingolf V. Herlet, Thomas Schultz Excited-state dynamics of cytosine tautomers *J. Am. Chem. Soc.* 131 (2009) 16939
11. **Kyriaki Kosma**, Sergei A. Trushin, Werner Fuß, Wolfram E. Schmid Cyclohexadiene ring opening observed with 13 fs resolution: Coherent oscillations confirm the reaction path *Phys. Chem. Chem. Phys.* 11 (2009) 172
12. **Kyriaki Kosma**, Sergei A. Trushin, Werner Fuß and Wolfram E. Schmid Ultrafast dynamics and coherent oscillations in ethylene and ethylene-*d*₄ excited at 162 nm *J. Phys. Chem. A* 112 (2008) 7514
13. **Kyriaki Kosma**, Sergei A. Trushin, Wolfram E. Schmid and Werner Fuß Vacuum ultraviolet pulses of 11 fs from fifth-harmonic generation of a Ti:sapphire laser *Opt. Lett.* 33 (2008) 723
14. **Kyriaki Kosma**, Sergei A. Trushin, Werner Fuß and Wolfram E. Schmid Characterization of the supercontinuum radiation generated by self-focusing of few-cycle 800-nm pulses in argon *J. Mod. Opt.* 55 (2008) 2141
15. Sergei A. Trushin, **Kyriaki Kosma**, Werner Fuß and Wolfram E. Schmid Wavelength-independent ultrafast dynamics and coherent oscillation of a metal – carbon stretch vibration in photodissociation of Cr(CO)₆ in the region of 270 – 345 nm *Chem. Phys.* 347 (2008) 309
16. Sergei A. Trushin, **Kyriaki Kosma**, Werner Fuß, and Wolfram E. Schmid Sub-10-fs supercontinuum radiation generated by filamentation of few-cycle 800 nm pulses in argon *Opt. Lett.* 32 (2007) 2432
17. Neset Aközbeğ, Sergei A. Trushin, Andrius Baltuska, Werner Fuss, Eleftherios Goulielmakis, **Kyriaki**

Kosma, Ferenc Krausz, Subhasis Panja, Matthias Uiberacker, Wolfram E. Schmid, Andreas Becker, Michael Scalora, Mark Bloemer Extending the supercontinuum spectrum down to 200 nm with few-cycle pulses *New J. Phys.* 8 (2006) 177

18. Sergei A. Trushin, Werner Fuß, **Kyriaki Kosma**, Wolfram E. Schmid Widely tunable ultraviolet sub-30-fs pulses from supercontinuum for transient spectroscopy *App. Phys. B* 85 (2006)

19. Sergei A. Trushin, Subhasis Panja, **Kyriaki Kosma**, Wolfram E. Schmid, Werner Fuß Supercontinuum extending from >1000 to 250 nm, generated by focusing 10-fs laser pulses at 805 nm into Ar *Appl. Phys. B* 80 (2005) 399

PUBLICATIONS IN CONFERENCE PROCEEDINGS

1. V. Tornari, M. Andrianakis, K. Hatzigiannakis, **K. Kosma**, V. Detalle, D. Giovanacci Combination of interferometry and thermography data for cultural heritage structural diagnostic research, Proceedings Volume 10331, Optics for Arts, Architecture, and Archaeology VI; 103310R (2017); doi: 10.1117/12.2272416

2. Maria-Georgia Konstantinou, Karolina Milenko, **Kyriaki Kosma**, Walter Margulis, and Stavros Pissadakis Light coupling and routing using a microsphere attached on the endface of a microstructured optical fibre Proc. SPIE 9886, Micro-Structured and Specialty Optical Fibres IV, 98860I (April 27, 2016)

3. Ioannis Konidakis, Maria Konstantaki, **Kyriaki Kosma**, and Stavros Pissadakis All-optical Optofluidic Switching in a ZnO-overlaid Microstructured Optical Fiber, Bragg Gratings, Photosensitivity and Poling in Glass Waveguides, BGPP-2014, paper JTU6A.2 <https://doi.org/10.1364/BGPP.2014.JTU6A.2>

4. **Kyriaki Kosma**, Kay Schuster, Jens Kobelke and Stavros Pissadakis In-fibre whispering gallery mode resonators: From isolated microspheres to coupled systems 16th International Conference on Transparent Optical Networks, ICTON 2014 Article number 6876327

5. **Kyriaki Kosma**, Gianluigi Zito, Kay Schuster and Stavros Pissadakis Whispering-gallery modes excitation in microspheres integrated inside microstructured optical fibers Proceedings of SPIE - The International Society for Optical Engineering Volume 8960 (2014) Article number 896017 Laser Resonators, Microresonators, and Beam Control XVI

6. Christian Schröter, **Kyriaki Kosma** and Thomas Schultz Correlated Rotational Alignment Spectroscopy of Isolated Molecules and Molecular Mixtures EPJ Web of Conferences, XVIIIth International Conference on Ultrafast Phenomena Volume 41 (2013) 12013

7. Sergei A. Trushin, **Kyriaki Kosma**, Werner Fuß, and Wolfram E. Schmid Supercontinuum from a few-cycle filament in argon: characterization and UV spectroscopic application Proceedings Volume 6733, International Conference on Lasers, Applications, and Technologies 2007: Environmental Monitoring and Ecological Applications; Optical Sensors in Biological, Chemical, and Engineering Technologies; and Femtosecond Laser Pulse Filamentation; 67332W (2007); doi: 10.1117/12.753262

CONTRIBUTIONS TO CONFERENCES AND MEETINGS

Kyriaki Kosma, W. Fuss, E. Goulielmakis, F. Krausz, S. Panja, M. Uiberacker, W. E. Schmid, S. A. Trushin **Supercontinuum extending from 200 to 2000 nm generated by self-focusing in argon**
Poster presentation: XTRA Summer School, XTRA Research Training Network, Ultra short XUV Pulses for Time-Resolved and Non-Linear Applications, Porquerolles Island, France, 25-28 May 2005

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid
Generation of short near-UV pulses and applications to pump-probe spectroscopy
Oral presentation: IV XTRA Network meeting, Imperial College London, 09-11 April 2006

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid

Widely tunable ultraviolet sub-30 fs pulses from supercontinuum for transient spectroscopy

Poster presentation: IAMPI 2006, International Conference on the Interaction of Atoms, Molecules and Plasmas with Intense Ultrashort Laser Pulses, Szeged, Hungary, 01-05 October 2006

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid

Pump-probe experiments for investigation of ultrafast reactions: towards 10-fs time resolution in the UV

Oral presentation: VI XTRA Network meeting, Padua, Italy, 26-27 February 2007

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid, B. Schneider

Ultrafast dissociation of $M(\text{CO})_6$: wavelength-independent coherent oscillations exclude a triplet path

Poster presentation: ECAMP 9 2007, European conference in Atoms, Molecules and Photons, Crete, Greece, 06-11 May 2007

Werner Fuß, K. Kosma, W. E. Schmid, S. A. Trushin

Ring opening of cyclohexadiene studied with 10 fs resolution: Coherent oscillations indicate the reaction coordinate

Poster presentation: Femtochemistry and Femtobiology 8, Oxford, UK, 22-27 July 2007

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid, B. Schneider:

Femtosecond time-resolved study of $M(\text{CO})_6$ ($M=\text{Cr, Mo, W}$): Photodissociation in the 270-350 nm region reveals no triplet path

Poster presentation: XXIII International Conference on Photochemistry ICP, Köln, Germany, 29 July-03 August 2007

Kyriaki Kosma, C. Schröter, I. V. Herlet, T. Schultz

Excited-state dynamics of cytosine tautomers

Poster presentation: DPG Frühjahrstagung der Sektion AMOP, Hamburg, Germany, 2 - 6 March 2009

Kyriaki Kosma, S. A. Trushin, W. Fuß, W. E. Schmid

Supercontinuum generation through filamentation in argon

Invited talk: Workshop, Nonlinear Optics in Guided Geometries, WIAS Berlin, Germany, 18 – 20 May 2009

Kyriaki Kosma, C. Schröter, T. Schultz

Photochemistry of Cytosine Tautomers

Poster presentation: ACU IV Symposium, Analysis and Control of ultrafast photoinduced reactions, Berlin, Germany, 8 – 10 October 2009

Kyriaki Kosma, C. Schröter, T. Schultz

Electronic structure and dynamics of cytosine

Poster presentation: DPG Frühjahrstagung der Sektion AMOP, Hannover, Germany, 8 - 12 March 2010

Christian Schröter, K. Kosma, I. V. Hertel, T. Schultz

CRASY: Correlated Rotational Alignment Spectroscopy Resolves Isotopic Structure

Poster presentation: DPG Frühjahrstagung der Sektion AMOP, Hannover, Germany, 8 - 12 March 2010

Paolo A. Carpeggiani, K. Kosma, P. Tzallas, D. Charalambidis

Ultrafast dynamics of the photo-dissociation of O_2

Poster presentation: ATTOFEL Summer School, Ultrafast Dynamics using ATTosecond and XUV Free Electron Laser Sources, Crete, Greece, 02 – 06 May 2011

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis

Whispering gallery mode microsphere resonator integrated inside a microstructured optical fiber

Poster Presentation: 5th Technical Meeting, COST Action TD1001 “OFSeSa” NOVEL AND RELIABLE OPTICAL FIBRE SENSOR SYSTEMS FOR FUTURE SECURITY AND SAFETY APPLICATIONS, Padua, Italy, 7 – 10 April 2013

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis

Microsphere resonator integrated inside a microstructured optical fiber

Oral Presentation: CLEO-EUROPE, Conference on Lasers and Electrooptics, Munich, Germany, 12 – 16 May 2013

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis

Microsphere resonators integrated inside microstructured optical fibers: studies and optimization

Invited talk: 6th Mediterranean Conference on Nano-Photonics MediNano-6, Lyon, France, 30-31 October 2013

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis

Whispering-gallery modes excitation in microspheres integrated inside microstructured optical fibers

Invited talk: SPIE Photonics West, San Francisco, USA, February 2014, 8960-42

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis

Whispering Gallery Mode microsphere resonators inside microstructured optical fibers

Poster presentation: 560. WE-Heraeus-Seminar: Taking Detection to the Limit -Biosensing with Optical Microcavities Bad Honnef, Germany, 14-18 April 2014

Kyriaki Kosma, Gianluigi Zito, Kay Schuster, Stavros Pissadakis,

Integration and excitation of microsphere optical resonators inside microstructured optical fibers

Invited Talk: SPIE Photonics Europe, Brussels, Belgium, April 2014, 9128-2

Ioannis Konidakis, Mary Konstantaki, Kyriaki Kosma, Stavros Pissadakis

All-optical Optofluidic Switching in a ZnO overlaid Microstructured Optical Fiber,

Oral presentation: Bragg Gratings, Photosensitivity and Poling in Glass Waveguides, BGPP-2014, Barcelona, Spain, 27-31 July 2014

Kyriaki Kosma, Kay Schuster, Jens Kobelke, George Nikolopoulos, Stavros Pissadakis

In-fibre whispering gallery mode microresonator: a two-sphere coupled system

Poster presentation: Optical wave and waveguide theory and numerical modelling workshop OWTNM 2015, London, United Kingdom, 16-18 April 2015

Maria-Georgia Konstantinou, K. Kosma, W. Margulis, and S. Pissadakis

A microspherical resonator embedded inside a microstructured optical fiber taper

Poster presentation: 4th Workshop on Specialty Optical Fibers and their Applications 2015, Hong Kong, China, 4–6 November 2015

Maria-Georgia Konstantinou, K. Milenko, K. Kosma, W. Margulis, and S. Pissadakis

Light coupling and routing using a microsphere attached on the endface of a microstructured optical fibre

Invited talk: SPIE Photonics Europe, Brussels, Belgium, 3-7 April 2016

Stavros Pissadakis, Kyriaki Kosma, Jens Kobelke, Kay Schuster

In-fiber, cross-coupled WGM cavities as high accuracy photonic verniers

Invited presentation: 5th Workshop on Specialty Optical Fibers and their Applications 2017, Limassol, Cyprus, 11–13 October 2017