

Apostolos Kalafatis

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Education

- 2014–2020 **Chemistry, Bachelor of Science**,
National and Kapodistrian University of Athens.
- 2021–2023 **Physical Chemistry & Chemical Physics (PCCP), Master of Science**,
Université de Bordeaux.

Experience

- May–Dec 2021 **Diploma Thesis, Supervisor Prof: A. Papakondylis**, NKUA, Department Of Chemistry, Laboratory Of Physical Chemistry.
"High accuracy ab-initio quantum chemical calculations of ground and low-lying electronic states of noble gas monohalide cations (NgX^+)" [Final Report in Greek](#)
- Jan–April 2022 **Molecular Spectroscopy Intern, Supervisor Prof: V. Rodriguez**, Université de Bordeaux, Institut Des Sciences Moléculaires (ISM), Groupe Spectroscopie Moléculaire (GSM) .
"Experimental study of linear and nonlinear optical properties and kinetic analysis of photo-switchable molecules in solutions" [Final Report](#)
- Jan–Aug 2023 **Master Thesis, Supervisor Prof: T. Stergiopoulos**, National Center Of Scientific Research (NCSR) "Demokritos", Institute Of Nanoscience And Nanotechnology (INN) .
"Silver Bismuth Sulfide Nanocrystal Solar Cells" [Final Report](#)

Projects

- Jan–April 2022 **Photoresponsive Nonlinear Optical Monolayers "PHONOM" (Project-ANR-20-CE29-0009)**, Université de Bordeaux, Institut des Sciences Moléculaires (ISM), Groupe Spectroscopie Moléculaire (GSM), Responsibility: **Analyses of linear and nonlinear optical properties of photoswitchable molecules in solutions.**
- Non-linear optical activity of chromophores in solutions
 - Hyper-Rayleigh scattering (HRS)
 - Kinetic analysis of chromophore solutions and self-assembled monolayers
 - Uv/Vis and micro-Raman spectroscopy
 - Magneto-optical effects (Faraday/electro-optic kerr effect)
 - Optical setups
- Jan 2022–Today **Hybrid, organic-inorganic chalcogenide optoelectronics "MIX2FIX" (ERC found ID:818615)**, National Center Of Scientific Research (NCSR) "Demokritos", Institute Of Nanoscience And Nanotechnology (INN), Photovoltaic and Optoelectronic Materials and Devices Group, Responsibility: **Solution-processed chalcogenide perovskites through molecular inks and colloids.**
- Deposition of semiconducting thin films
 - Halide/chalcogenide perovskites and other metal chalcogenides (AgBiS_2 , Sb_2S_3 , SnS_x etc.)
 - Nanoparticle and solvothermal synthesis
 - Physical vapour deposition
 - Quantum dot solar cells: device fabrication and characterization
 - PL, PLQE, Uv-Vis, FTIR, DR, RAMAN
 - AFM, SEM/TEM, UPS, XPS, EDX, XRD, XRF, DLS
 - Working in gloveboxes

Conferences & Seminars

- 2019 **17th Hellenic Conference of Clinical Chemistry**,
Athens, Greece.
- 2020 **2nd Cycle Seminar by the Greek Society of Clinical Chemistry - Clinical Biochemistry**,
Athens, Greece.
- 2022 **4th Physical chemistry and chemical physics Workshop (PCCP)**,
Bordeaux, France.
- 2022 **29th International Conference on Image Processing (ICIP) - Institute of Electrical and Electronics Engineers (IEEE)**, *Bordeaux, France.*
- 2023 **5th Physical chemistry and chemical physics Workshop (PCCP)**,
Bordeaux, France.
- 2023 **2nd International Conference on Nanotechnologies & Bionanoscience (Nanobio)**,
Heraklion, Greece.
- 2024 **59th Summer School National Center Of Scientific Research (NCSR) "Demokritos"**,
Athens, Greece.
- 2024 **7th International conference on Perovskite solar cells and optoelectronics (PSCO)**,
Perugia, Italy.
- 2025 **Materials for sustainable development (MATSUS)**,
Seville, Spain.

Skills

Speaking Languages	○ Greek(Native) ○ English(Full Professional Proficiency - IELTS 7) ○ French(Elementary Proficiency) ○ Italian(Limited Working Proficiency)
Science topics	Physical Chemistry, Material Science, Nanomaterials, Spectroscopy, Solar Cells, Thin film deposition, Organic chemistry
Techniques	Uv-Vis, FTIR, RAMAN, HRS, SHG, Photonic Setups, XRD, PL, AFM, SEM/TEM, XPS, optoelectronic characterization of solar cells
Coding	Fortran90, Python, C++, Tex
Software	Gaussian, Molpro, AMPAC, OriginPro, LabView, KaleidaGraph, Quantum Espresso, MS-Office, Adobe Creative Cloud, Fusion360, FreeCAD
OSs	Windows, LINUX/UNIX

Accomplishments

- 2021–2023 **Scholarship Holder for master studies**, *Sofoklis Achilopoulos Foundation.*
- 2021 **Computer Operating Certificate**, *National and Kapodistrian University of Athens, NKUA.*
- 2005–2013 **Degree in Advanced Music Theory**, *Volos Municipal Music School.*
- 2005–2010 **Violin studies, "katotera" Grade**, *Volos Municipal Music School.*
- 2011–2013 **Piano Preliminary Studies**, *Volos Municipal Music School.*

Memberships

- 2021–Today **Greek Chemists Association Membership.**
- 2022–Today **Société Chimique de France Membership.**
- 2021–Today **PCCP Association membership.**

Awards

- Nanoscale poster prize by the Royal Society Of Chemistry for the poster presentation at the 2nd International Conference on Nanotechnologies & Bionanoscience (Nanobio 2023)

Publications

- Rodriguez, V., Verreault, D., Adamietz, F. & **Kalafatis, A.** All-Optical Measurements of the Verdet Constant in Achiral and Chiral Liquids: Toward All-Optical Magnetic Spectroscopies. **ACS Photonics** **9**, 2510–2519 (2022). doi.org/10.1021/acsp Photonics.2c00720
- Dubuis, S., Dellai, A., Courdurié, C., Owona, J., **Kalafatis, A.**, Vellutini, L., Genin, E., Rodriguez, V. & Castet, F. Nonlinear Optical Responses of Photoswitchable Donor–Acceptor Stenhouse Adducts. **J. Am. Chem. Soc.** **145**, 10861–10871 (2023). [doi:10.1021/jacs.3c02778](https://doi.org/10.1021/jacs.3c02778)
- Dallas, P., Gkini, K., Kaltzoglou, A., Givalou, L., Konstantakou, M., Orfanoudakis, S., Boukos, N., Sakellis, E., Tsipas, P., **Kalafatis, A.**, Karydas, A. G., Lagogiannis, A., Falaras, P., Psycharis, V. & Stergiopoulos, T. Exploring the potential of powder-to-film processing for proof-of-concept BaZrS₃ perovskite solar cells. **Materials Today Communications** **108608** (2024). [doi:10.1016/j.mtcomm.2024.108608](https://doi.org/10.1016/j.mtcomm.2024.108608)
- **Kalafatis, A.**, Theofylaktos, L., & Stergiopoulos, T. Spin coating on a budget: A 3D-Printed all-mechanical alternative for cost-effective thin-film deposition. **Hardware-x** (2024). <https://doi.org/10.1016/j.ohx.2024.e00547>
- Theofylaktos, L., **Kalafatis, A.**, Harlaftis, F., Orfanoudakis, S., Symeonidou, E., Karnachoriti, M., Mavropoulis, A., Dimitrakis, A., Kontos, G., & Stergiopoulos, T., Thiophene-based Hole Transport Layer Control for Efficient Carrier Extraction in Sb₂S₃ Solar Cells **In preparation** (2024).

Posters & communications

- 4th PCCP Workshop (Bordeaux, France - 2022); **Kalafatis, A.**, Dubuis, S. & Rodriguez, V., "**Linear and nonlinear optical properties and kinetic analysis of photoswitchable molecules in solutions**", *Poster presentation*
- 5th PCCP Workshop (Bordeaux, France - 2023); **Kalafatis, A.**, "**AgBiS₂ nanocrystal solar cells**", *Oral communication*
- 37th Panhellenic Conference on Solid State Physics and Materials Science (Thessaloniki, Greece - 2023); Theofylaktos, L., **Kalafatis, A.**, Orfanoudakis, S., Dallas, P., Basina, G., Gkini, K., Tsipas, P., Sekelis, E., Psycharis, V., Stergiopoulos, T. & Sazou, D. "**Novel synthetic route to Stibnite-Bismuthinite BiSbS₃ solid solution series as a candidate material for energy applications**", *Poster presentation*
- 2nd International Conference on Nanotechnologies & Bionanoscience (Nanobio) (Heraklion, Crete - 2023); Orfanoudakis, S., Harlaftis, F., Gkini, K., Theofylaktos, L., **Kalafatis, A.**, Basina, G., Givalou, L., Konstantakou, M., Kontos, A.G. & Stergiopoulos, T., "**A thiol-based salt for surface passivation in perovskite solar cells**", *Poster presentation*
- 2nd International Conference on Nanotechnologies & Bionanoscience (Nanobio) (Heraklion, Crete - 2023); Theofylaktos, L., Givalou, L., Gkini, K., Orfanoudakis, S., **Kalafatis, A.**, Basina, G., Dallas, P., Tsipas, P., Psycharis, V., & Stergiopoulos, T., "**Emerging Sb₂S₃ absorber for planar chalcogenide solar cells via optimized Sb(oAc)₃-Thiourea-DMF route**", *Poster presentation*
- 2nd International Conference on Nanotechnologies & Bionanoscience (Nanobio) (Heraklion, Crete - 2023); **Kalafatis, A.**, Theofylaktos, L., Orfanoudakis, S., Dallas, P., Givalou, L., Gkini, K., Basina, G., Konstantakou, M., & Stergiopoulos, T., "**Two-step ligand exchange strategy for AgBiS₂ conductive thin-films for photovoltaic applications**", [Poster presentation](#)
- 59th Summer School National Center Of Scientific Research (NCSR) "Demokritos" (Athens, Greece - 2024); **Kalafatis, A.**, Theofylaktos, L., Orfanoudakis, S., Gkini, K., Dallas, P. & Stergiopoulos, T., "**Solution-processed metal sulfide thin films for optoelectronic and thermoelectric applications**", [Poster presentation](#)
- 7th International conference on Perovskite solar cells and optoelectronics - PSCO (Perugia, Italy - 2024); **Kalafatis, A.**, Theofylaktos, L., Orfanoudakis, S., Gkini, K., Dallas, P., Konstantakou, M. & Stergiopoulos, T., "**Metal sulfide thin films from single-source molecular inks: Steps towards solution-processed chalcogenide perovskites**", [Poster presentation](#)
- Materials for sustainable development (MATSUSSpring25). (Seville - 2025); **Kalafatis, A.**, Orfanoudakis, S. & Stergiopoulos, T. "**Broadband Vis-NIR emission from QDot blends: Steps towards single-emissive-layer white monolithic LEDs**", [Poster presentation](#)
- Materials for sustainable development (MATSUSSpring25). (Seville - 2025); Orfanoudakis, S., Dallas, P., Kontos, A.G., **Kalafatis, A.**, & Stergiopoulos, T. "**Organic Modification of CuInS₂ Quantum Dots for Light-Emitting Applications**", *Poster presentation*

Research Interests

- Material science
- Nanomaterials; synthesis and characterization
- Solar cells
- Photonics
- Organic chemistry
- Quantum chemistry (Ab Initio, DFT & semi-empirical methods)
- Molecular spectroscopy
- Nonlinear optics