

ALEXANDROS LAPPAS

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Lab: [Quantum Materials & Magnetism](#)

EDUCATION

- 1989 – 1993 D.Phil., Chemical Physics; School of Chemistry, University of Sussex, UK
Thesis: *Physical Properties of Magnetic and Superconducting Layered Copper Oxides*
Supervisor: Prof. Kosmas Prassides
- 1983 – 1988 B.Sc., Physics (upper 2nd class honors); Dept. of Physics, University of Crete, Greece
Final year diploma work: *Studies of Polycarbonates by Depolarized Rayleigh Scattering*
Supervisor: Prof. George Fytas

FELLOWSHIPS - AWARDS - DISTINCTIONS

- 2018 Presented with the “[Gold Medal of the City](#)” of Xanthi, in recognition of his contribution as one of the City's ambassadors in sciences and environment; Municipality of Xanthi, Greece
- 2016 Recipient of a “[Fulbright Visiting Scholars Award](#)”, Fulbright Foundation, Athens, Greece
- 2015 Recipient of a “[Chaire TOTAL - Pôle Chimie Balard](#)”, Fondation Balard, Montpellier, France
- 2003 Visiting Fellowship at Kyoto University; YAMADA Science Foundation, Osaka, Japan
- 2000 Award for Scientific Research at IESL-FORTH; EBEIRIKIO Foundation, Athens, Greece
- 1993 – 1995 Postdoctoral Research Fellowship; Engineering and Physical Sciences Research Council, UK
- 1990 – 1993 Research Bursary, BRITE-EURAM Programme on Advanced Materials; Commission of the European Communities, Brussels, Belgium
- 1989 – 1992 Research Studentship (Quota Award); Science and Engineering Research Council, UK
- 1983 – 1984 Prize for excellence in Physics, University of Crete; State Scholarships Foundation – IKY, Greece

EMPLOYMENT – Research Experience

- Collective and emergent quantum phenomena in crystalline inorganic functional materials* (research coordinator: A. Lappas)
- 2012 – present Research Director (Grade A; equivalent to a University Professor position; *open-end*); IESL - FORTH, Greece
- 2002 – 2012 Principal Researcher (Grade B; *tenure*); IESL - FORTH, Greece
- 1998 – 2002 Associated Researcher (Grade C; *tenure-track*); IESL - FORTH, Greece
- Structure-composition-property relations of transition metal oxide and fulleride magnets and superconductors* (research coordinator: K. Prassides)

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1997 – 1998 Temporary Lecturer; School of Chemistry, University of Sussex, UK
1993 – 1995 Postdoctoral Fellow; School of Chemistry, University of Sussex, UK

COMPULSORY MILITARY SERVICE

Jan 1996 – Jul 1997 Served in the Greek army

EMPLOYMENT – Teaching Experience

2016 Lecturer, “Fulbright Fellow”; Physics Department, Stony Brook University, USA
*Lecture course development**
- Functional (Nano)materials and Magnetism (18 hours; 4th year UG & PG)

2015 Lecturer, “Chaire TOTAL - Pôle Chimie Balard”; Institut de Chimie Moléculaire et des Matériaux, Université de Montpellier 2, France
*Developed lecture course**
- Advanced Functional Nanomaterials and Magnetism (10 hrs; PG)

2005 – 2008 Adjunct Professor; Department of Physics, University of Crete, Greece
*Developed lecture courses**
- Experimental Methods for Studying Novel Physical Properties (4 hrs/week; 4th year UG & PG)
- Structural and Chemical Analysis of Materials (4 hrs/week; 3rd year UG)

2001 – 2005 Adjunct Professor; Department of Materials Science and Technology, University of Crete, Greece
*Developed lecture courses**
- Materials II: Crystallography (3 hrs/week, 2nd year UG)
- Methods for Materials Syntheses (3 hrs/week, 3rd year UG)
- Structural and Chemical Analysis of Materials (4 hrs/week, 3rd year UG & PG)
Laboratory instructor
- General Chemistry I (5 hrs/week, 1st year UG)

1997 – 1998 Temporary Lecturer; School of Chemistry, Physics and Environmental Sciences, University of Sussex, UK
*Lecture course**
- Modern Materials (2 hrs/week, 3rd year UG)
Laboratory instructor
- Inorganic Chemistry Practical (6 hrs/week, 2nd year UG)
- Computing (3 hrs/week, 1st year UG)
Weekly tutorials on Chemical Reactivity (1st year UG)

* set & marked examinations, as well as lab reports; UG= undergraduate (class size 20-25); PG= postgraduate (class size ~10)

RESEARCH SUPERVISION / MENTORING

- Currently I manage a small team of young researchers, holding regular group-meetings, which facilitate their supervision.
- Supervision of final year diploma works, MSc and PhD theses (**).

2013 – *present* Supervisor of PhD degrees in progress (2)
2014 – 2019 Supervised the dissertation of an awarded PhD degree (1)
2011 – 2016 Supervised the dissertation of an awarded PhD degree (1)
2014 – 2016 Supervised a postgraduate student awarded with an MSc degree (1)
2006 – 2014 Supervised the dissertation of awarded PhD degrees (3)

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2004 – 2010	Supervised postgraduate students awarded with an MSc degree (3)
2000 – 2001	Co-supervision of awarded postgraduate MSc theses (3)
1992 – 1998	Co-advisor of experimental research projects for 3 rd year undergraduates (5)

(**) Theses titles are compiled in APPENDIX IV.

- Former Post-doc Fellows I supervised in my lab (***) are now in tenure-track careers at organizations such as: *PANalytical, Johnson Matthey, Kent University, Ecole Centrale Paris, National Physical Lab, Ecole Nationale Supérieure de Chimie de Paris, Zhejiang Sci-Tech University.*

2012 – 2015	Post-doc Fellows funded via collaborative national grants (2)
2007 – 2010	Marie-Curie Post-doc Fellows (9)
2006 – 2009	Post-doc Fellows shared with ISIS-RAL (2)
2003 – 2004	Co-funded Post-doc Fellow of British Council – General Secretariat of Research & Technology (1)
2000 – 2003	Marie-Curie Post-doc Fellows (2)

(***) Research theme titles are summarized in APPENDIX IV.

VISITING SCIENTIST

2016, Sept - Dec	“Fulbright Fellow”; Condensed Matter Physics & Materials Sci. Dept., Brookhaven National Lab, USA; Host: X-ray scattering group
2015, Nov	Institut Charles Gerhardt Montpellier, Université de Montpellier, France; Host: Prof. Werner Paulus
2014, Jun - Jul	Condensed Matter Physics & Materials Sci. Dept., Brookhaven National Lab, USA; Host: Dr Emil Bozin and Prof. Simon Billinge
2011, Jul	Department of Physics, Zhejiang Sci, Tech. University, China; Hosts: Dr Peigang Li & Prof. Weihua Tang
2010, May - Jun	National Nanotechnology Lab, Lecce, Italy; Hosts: Dr Davide Cozzoli & Prof. Liberato Manna
2003, Jun - Jul	Graduate School of Chemistry, Kyoto University, Japan; Host: Prof. Hiroshi Kageyama
2000 - <i>present</i>	I have been working as a principal investigator (PI) at world renowned large-scale facilities of synchrotron X-ray (Brookhaven National Lab), neutron (NIST Center for Neutron Research, Rutherford Appleton Lab) and muon (Paul Scherrer Institute) science, in USA and Europe; access to their infrastructures is highly competitive and awarded after peer-review of science proposals I composed in my capacity as a PI.

SOURCES OF INDEPENDENT FUNDING

- Project leader in a number of European and National research and technology programmes funded by: General Secretariat of Research and Technology - Greece (GSRT)/ European Commission (EC)/ The Royal Society (UK)/ NATO/ British Council/ Greek Ministry of Education/ Office of Naval Research Global (ONRG).

PI= Coordinator, co-PI= co-Coordinator, P= Participating co-investigator; NSRF= National Strategic Research Framework 2007-2013

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Dates	Description	Program	Funding Organisation	IESL Funding (Budget)
2021-2023 (PI)	<i>Functional Nanoclusters for Multimodal Imaging of Atherosclerosis</i>	“Theodore Papazoglou” FORTH Synergy Grants	FORTH	80 k€
2017-2022 (PI)	<i>Molecule Intercalated Iron Chalcogenides</i>	Broad Agency Announcement for Navy & Marine Corps S&T	ONRG	300 k€ (398 k\$)
2015-2016 (P)	<i>Nanotechnology & Advanced Materials for Applications in Energy, Environment & Industry</i>	Research Programs for Excellence	GSRT - IKY - SIEMENS	143 k€ (282 k€)
2013-2015 (co-PI)	<i>Advanced Energy Materials</i>	Res. Inst. Development Program KRIPIS, NSRF	GSRT - Ministry of Education	800 k€ (1,573 k€)
2013-2015 (P)	<i>Systems Biology Multidisciplinary Activities</i>	Res. Inst. Development Program KRIPIS, NSRF	GSRT - Ministry of Education	270 k€ (2,517 k€)
2012-2015 (P)	<i>ZnO Nanostructures & Applications in Nanophotonics</i>	THALES, NSRF Cooperation	Ministry of Education	155 k€ (599 k€)
2011-2014 (PI)	<i>Magnetic Frustration & Magnetoelectric Behaviour</i>	HERAKLITOS II, NSRF PhD Fellowship	Ministry of Education	45 k€
2006-2010 (PI)	<i>Hybrid Nanocrystals with Tailored Properties</i>	Marie-Curie TOK-DEV Fellowships	EC	657 k€ (807 k€)
2005-2008 (P)	<i>ISIS Target Station 2 (WISH; High-Resolution NPD)</i>	Construction of New Infrastructures	EC	259 k€ (398 k€)
2003 (PI)	<i>P- & H-induced Modifications in Low-D Materials</i>	Visiting Fellowship	YAMADA Science Foundation (Japan)	500,000 YEN
2003-2005 (PI)	<i>P- & H-induced Control of Magnetism in V-bronzes</i>	Bilateral Co-operation, IESL/FORTH & Royal Institution of GB	GSRT	12.8 k€
2002-2006 (P)	<i>Participation in Research Excellence Program on Materials</i>	Granted by the Ministry of Development	GSRT	50.0 k€
2002-2005 (PI)	<i>Spin-Gap in Low-Dimensional Materials</i>	Bilateral Co-operation, IESL/FORTH & Institute Josef Stefan (IJS)	GSRT	11.7 k€
2000-present (PI)	<i>Facility Beamtime for: Neutron, Synchrotron & Muons</i>	Training and Mobility of Researchers (TMR)	EC	Travel & Subsistence to EU Large-Scale Facility Labs
2000-2002 (P)	<i>Metal-Insulator Transitions in Ternary Fulleride Salts</i>	Collaborative Linkage Grant, Sussex Univ. – IJS – IESL/FORTH – NHMFL	NATO	US\$ 19,000
2000-2004 (PI)	<i>Organic-Inorganic Nanocomposites</i>	Marie-Curie Development Host Fellowships	EC	225 k€
2000 (PI)	<i>Polymerisation in Ternary Fullerides</i>	Award for Scientific Research	EBEIRIKIO Foundation (Greece)	5.8 k€
2000 (PI)	<i>Nanocomposite Materials: Structure-Property Relations</i>	Study Visit (4 wks)	Royal Society	Travel + £1,000
1999-2001 (PI)	<i>Metal-Insulator Transitions in Polymeric Fullerides</i>	Bilateral Co-operation, IESL/FORTH & IJS	GSRT	8.8 k€

ADMINISTRATION - Service to the Foundation

- *Team leader*: Director of research, committed to academic leadership, responsible for project management, fund raising, implementation of recruitment, laboratory setup, measurements, characterization and dissemination of results.
- 2006 – 2018: *Elected* member of the IESL’s Scientific Advisory Board for consecutive 3 yearly terms. The board provides Institutional leadership by making recommendations on Science &

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Technology priorities, annual budget and spending, as well as on the professional development of the administrative & technical personnel.

- *Appointed* member (2006, 2008) and chairman of the executive committee (2011, 2013) for the assessment of the professional practice and continuous professional development/ training of the IESL's administrative & technical personnel.
- *Appointed* (2009) to the executive committee for restructuring the IESL's research directions, with focus to enhance research capacity within the Materials and Devices Division.
- *Scientific coordinator* (2003-2008 intermittently) of the seminars' committee for IESL.
- *Elected member* and vice-chairman (2012-2014) of the governing board of the union of FORTH's tenure-track Researchers.
- *Elected* (2008-2019) to several search committees for hiring in tenure-track Researchers positions at IESL.
- *Elected* (2016) member of a 7-member committee established to appoint the new Head of the Board of Directors (equivalent to a University Chancellor position) at FORTH.

ADMINISTRATION – Other Professional/ Academic Contribution

- *Appointed* (2011-2015) to a 5-member expert group on Nanotechnology that advises the Hellenic Federation of Enterprises (S.E.V.) and provides annual foresight reports on the prospects of the Greek industry to adopt forefront technologies.
- *Appointed* to a 4-member committee for professional advice to the government body GSRT (on the occasion of Greek EC presidency Jan.-Jun. 2003), on the “European Research Infrastructures and Their Role in Structuring the European Research Area”.
- *Appointed* (2014-2018) expert witness to the management committee of the COST Action entitled “Towards Oxide-Based Electronics” (MP1308).
- *Referee* for: Physical Review B/ Physical Review Letters/ Chemistry of Materials/ Nanoscale/ Journal of Solid State Chemistry/ Journal of Physics and Chemistry of Solids/ Physica B/ Appl Phys A/ IEEE Transactions on Magnetics/ Nanomaterials/ Advanced Science/ ACS Applied Nano Materials/ ACS Omega/ Journal of Physical Chemistry.
- *External PhD examiner* for: ICGM Montpellier, University of Montpellier; Physics Department, University of Ljubljana; Chemistry Dept., University of Crete; Physics Dept., University of Crete; Materials Science and Engineering Departments of the Universities of Crete & Ioannina.
- *Co-chairing* the session on “Assembly-mediated surface coatings” (subtopic C3.2) in the context of the “EUROMAT 2015” series of conferences.
- *Co-chaired* the programme committee of the “2013 Joint European Magnetic Symposia”.
- *Co-organized* (2008, 2014) the “Panhellenic Conference on Solid State Phys. & Materials Science”.
- *Session chairing* at international conferences (e.g. Micro & Nano 2012; JEMS-2013; SUPERSTRIPES 2013, 2014, 2015; ESS 2014 Athens workshop; ICPAM 2016, 2018; ICMAGMA 2018).
- *Advisory board* of “7th International Conference of the Hellenic Crystallographic Association”, Heraklion, 2014.
- Scientific committee of “9th International Conference of the Hellenic Crystallographic Association”, Patras, 2018.
- *Appointed* Section Editorial Board of Materials Physics, for “Materials” (MDPI), 2019-present.
- *Appointed* Topical Advisory Panel Member, for “Nanomaterials” (MDPI), 2019-present.
- *Appointed* to the Fulbright Selection Committee in Sciences, Engineering and Business Administration for the 2021-2022 Greek Graduate Students scholarships (Masters and/or PhD).

ADMINISTRATION - External Reviewer of R&D Proposals

- the Institute of Materials Science of Barcelona (ICMAB-CSIC), under the Frontier Interdisciplinary Projects (FIP), 2021 Call (FUNFUTURE-FIP-2021).
- the Management and Implementation Authority for Research, Technological Development and Innovation Actions (MIA-RTDI), Greece, under the framework of “RESEARCH – CREATE – INNOVATE” (2nd Cycle) funding schemes, Chaired (2019) the evaluation committee in the thematic area of “Energy” (EPAnEK 2014-20).
- the European Commission, under the FET OPEN RIA Call for proposals (2018-19).
- the Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI), Programme 4 – Fundamental and Frontier Research, under the national plan for research, development and innovation 2015-2020, PN III.
- the Romanian National Council for Scientific Research, under the national plan for research, development and innovation 2007-2013, PN II.
- the European Commission, under the ERC Starting Grant proposals (2012-13).
- the “K. Karatheodori” Foundation, Greece, related to 2013 natural sciences proposals.
- the NIST Center for Neutron Research (NCNR), USA, proposals requesting beam time on the facility’s neutron scattering instrument suite (access cycles 2011, 2013, 2014, 2016, 2019, 2021).
- the General Secretariat for Research and Technology (GSRT), Greece, under the funding scheme of “bilateral” international co-operation programs (2002-04).

RESEARCH INTERESTS

Dr Lappas developed, from the outset, his own activity at IESL-FORTH. While managing research and teaching workloads he established and now leads the Quantum Materials & Magnetism lab; the endeavor required construction, procurement and installation of lab facilities. He works in the field of experimental condensed matter materials science, studying electronic phenomena and phase transitions in correlated electron systems and other quantum materials that tackle societal needs for energy efficient technologies.

His research addresses cooperative phenomena of interacting charge carriers and magnetic/ electric moments (e.g. spin & charge order, superconductivity) in complex oxides and chalcogenides that drive nanoscale fluctuations of the crystal structure, leading to emergent phase behavior. Materials range from tailored functionalized nanoparticles to energy-efficient intercalation compounds that are grown cost-effectively by optimizing in-house developed installations. At present, challenges stem from coupled phenomena in solids that are exploited with the aim to improve functionality pertaining to selected biomedical (e.g. ferrite-based nanocrystals for image-guided therapy) or electronic (e.g. frustrated mixed-valent oxides for magnetoelectric memories) applications. These are tackled by a multimodal approach requiring strategic collaborations and appropriate development of in-house magnetic, dielectric, transport experimental and spectroscopic probes that are integrated in sophisticated sample environments (for low temperatures, high magnetic fields and elevated pressures). As the chemistry and physics of quantum complex materials entail a variety of length and time scales, insights are sought on their electronic and atomic structure and dynamics through unique experimental tools based at European (ISIS-UK; PSI-Switzerland; ESRF-FR) and US (NCNR-NIST, NSLS-BNL) user-facilities of neutron, synchrotron X-ray and muon science.

COLLABORATIONS

Cost-efficient knowledge transfer and resource-sharing through active links with:

- ‘next-of-keen’ laboratories at national level: *Univ. of Crete, Univ. of Ioannina, Aristotle Univ. of Thessaloniki, NCSR Demokritos.*

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- *Institute Jozef-Stefan (IJS), Slovenia*; Dr Andrej Zorko, Prof Denis Arcon; solid state NMR and ESR investigations of multiferroics, frustrated magnets, low-dimensional compounds.
- *University of Pavia, Italy*; Prof Alessandro Lascialfari; NMR relaxometry of nanoarchitectures for magnetically driven contrast enhancement.
- *Institute de Physique et de Chemie des Matériaux de Strasbourg, France*; Prof. Sylvie Begin-Colin; functionalised nanoparticles for biomedical applications.
- *Laboratoire CRISMAT, UMR 6508, France*; Dr Christine Martin; growth of induced magnetoelectrics and physical crystallography.
- *CMPMSD, Brookhaven National Lab, USA*; Dr Emil Bozin; nanoscale fluctuations and broken symmetry states in strongly correlated electron systems.

PUBLICATIONS & CITATIONS

- *h*-index= 26 (Web of Science, March 2022; [ResearcherID: F-6771-2011](#)), 2103 citations
- 106 papers in international peer-reviewed journals
- 26 invited, 1 keynote, 2 plenary lectures and numerous talks (49) in international conferences

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

- Hellenic Crystallographic Association (Oct. 2004 – *present*).
- Hellenic Society for Science & Technology of Condensed Matter (Sept. 2003 – *present*).
- European Materials Research Society (Sept. 2015 – *present*)