

**PERSONAL DATA**

Date 25/03/2023

Name and surname	Daniel Jaque García		
Contact details	Email: daniel.jaque@uam.es Phone: +34653463256. FAX: +344978579		
DNI / NIE / passport	07247008F	Age	48
ID no. Researcher	ORCID code	0000-0002-3225-0667	
	SCOPUS ID	7006396167	

**A.1. Current professional status**

Organism	Autonomous University of Madrid		
Dpto./Centro	Science Faculty		
Address	Department of Materials Physics		
Phone	653463256	email	<a href="mailto:daniel.jaque@uam.es">daniel.jaque@uam.es</a>
Professional category	Full Professor	Start date	09/01/2021
Spec. Ref. UNESCO			
Keywords	Photonics, spectroscopy, nanotechnology		

**A.2. Academic training**(Title, institution, date)

Bachelor / Degree / PhD	College	Year
Certificated in Physics	Sussex University	1994
Bachelor in Physics	Universidad Autónoma de Madrid	1995
D.Sc.	Universidad Autónoma de Madrid	1999

**A.3. Quality indicators of scientific production**

**Number of doctoral theses directed in the last since 1 January 2009: 12.**

**Citations: 17653** (Scopus), **21010** (Google Scholar)

**h index = 61** (Scopus), **69** (Google Scholar)

**Patents: 4.**

**Publications: 443** (Web of Science). **Last 5 years: 79**

**FREE CURRICULUM SUMMARY**

Daniel Jaque obtained his degree in Physics in 1995 at Sussex University (UK). He later obtained his PhD in 1999 at UAM, being awarded with the Extraordinary Thesis Award of the Faculty of Sciences because his work on multifunctional lanthanide-based solid-state lasers. In the 1999-2002 period, Daniel Jaque moved to Universidad Complutense de Madrid where we worked on magneto-optical properties of superconducting thin films including f-ion based ceramics.

In 2002 he moved back to Universidad Autonoma de Madrid where he founded the Fluorescence Imaging Group (FIG) and started his research on the use of f-ions for the fabrication and structural imaging of micro-photonic structures. By using hyperspectral confocal microscopy as main tool, Daniel Jaque manage to ger relevant works in the field such as the first modulation of the emission of lanthanide ions in a crystalline environment by the inscription of three dimensional photonic band-gap structure ("*Rare-Earth Spontaneous Emission Control in Three-Dimensional Lithium Niobate Photonic Crystals*" *Adv. Materials* 11, 3526 (2009)) or the achievement of quantum defect limit in a waveguide laser ("*Highly efficient laser action in femtosecond-written Nd:Yttrium aluminum garnet ceramic waveguides*" *Appl. Phys. Lett.* 92, 111103 (2008)).

In 2009 he was awarded with the Junior Research Award by the European Association for the Study of Rare Earths and Actinides. Since 2009 the group entered into the nanoscience field. From that moment on, the group has grown by the incorporation of researchers from different areas including chemistry, biology, medicine and pharmacy. In 2015 the group was incorporated into the Institute of Biomedical Research of the Hospital Ramón Y Cajal (Madrid, Spain) changing the name to nanomaterials for Bioimaging Group (nanoBIG.eu). Since that moment the research activity of NanoBIG, directed by Prof. Jaque, has mainly focused on the use of f-ion doped nanoparticles for bioimaging, biosensing and pre-clinical diagnosis and

therapy. During last years, NanoBIG, under the managing of Daniel Jaque, has contributed to the development of biophotonics by the publication of unique advances in the field.

Prof. Daniel Jaque has participated in managing the COST research networks on f-Elements and Up-converting nanomaterials, with participants located in eleven different European countries. He has also acted as coordinator of two Marie Skłodowska-Curie Fellowships. Prof. Daniel Jaque is the principal investigator of the FIBRYCIS-UAM research group, participating in the FET-OPEN proposal NanoTBTech, whose goal is the development of new sensing technologies for advanced in vivo imaging.

Between 2009 and 2011 he also participated in the governance of the university as Vice Dean of Studies in the Faculty of Science, taking care of the implantation at UAM of the new bachelor (9 degrees) and graduate (23 degrees) programs. He has also been coordinator of the Doctorate Program in Light-Matter Physics from 2011 until 2013. Prof. Daniel Jaque has been member of the Scientific Committee of the Ramon y Cajal Institute for Biomedical Research (IRYCIS, 2014-2018).

Prof. Daniel Jaque has published 438 research articles in indexed peer-reviewed international journals, obtaining approximately 16092 citations (H-index = 60) and he is the author/coauthor of 7 scientific books. Prof. Jaque's body of work is receiving, on average, over 1400 citations per year during last 5 years. Prof. Jaque has been the principal investigator in 17 research projects and participated in 30 more.

Prof. Daniel Jaque has proven experience in mentoring of young researchers: he supervised 12 Ph.D. theses and 12 M.Sc./B.Sc. theses in national and international programs (Spain, Brasil, China and Great Britain). He is now supervising 4 Ph.D. students. His research activities are highly collaborative on an international scale (with more than 20 groups from America, Europe, Asia and Oceania) and he presented the achieved successful scientific outcome in more than 60 invited talks at international conferences. Prof. Daniel Jaque has been invited professor at Heriot Watt University (UK), Universidad Federal de Alagoas (Brasil) and Swinbourne University of Technology (Australia). He has been recently selected as president of the Scientific Committee of the International Conference of Luminescence.

Prof. Jaque has been Editor of Optics Express (2010-2012) and Optical Materials (2015-2019). He is currently acting as director of NanoBIG group at UAM and IRYCIS, Editor of Physica B and Vice-rector of Research Policy of Universidad Autonoma de Madrid.

## SIGNIFICANT MERITS

### Publications

Among a total of 443 publications in journals such as Chemical Reviews, Advanced Materials, Nature Methods, Nature Communications, Advanced Functional Materials, ACS Nano, Nano Letters, and Light Science and Applications. The following 10 are highlighted:

**1.-** Vetrone, F., Naccache, R., Zamarrón, A., De La Fuente, AJ, Sanz-Rodriguez, F., Maestro, LM, Rodriguez, EM, **Jaque, D.**, Sole, JG, Capobianco, JA "Temperature sensing using fluorescent nanothermometers "(2010) ACS Nano, 4 (6), pp. 3254-3258. 1092 citations.

**2.- Jaque, D.**, Vetrone, F. "Luminescence nanothermometry" (2012) Nanoscale, 4 (15), pp. 4301-4326. 1090 citations

**3.- Jaque D.**, L.M. Maestro, B. del Rosal, P. Haro-Gonzalez, A. Benayas, J.L. Plaza, E.M. Rodriguez, and J.G. Sole "Nanoparticles for photothermal therapies". Nanoscale. 6, 9494-9530 (2014). 1174 citations

**4.-** Rocha, U., C. Da Silva Jacinto, Ferreira Silva W., I. Guedes, Benayas A. Martinez Master L., M. Acosta Elias, Bovero E., Van Veggel F., Garcia J. Sole, **Jaque D.** "Subtissue thermal sensing based on neodymium-doped LaF<sub>3</sub> nanoparticles" ACS Nano 7, 2, 1188-1199 (2013). 273 citations.

**5.-** Carrasco E., Rosal B., Sanz-Rodriguez F., Juarranz A., Rocha U., Jacinto C., García Solé J. ,and **Jaque D.** "Intratumoral Reading Thermal Photo-Thermal Therapy During Multifunctional Fluorescent Nanoparticles by" Advanced Functional Materials. 25 (4) 615-626 (2015). 198 citations.

**6.-** Rocha U., Kumar K.U. ,Jacinto C., Villa I., Sanz-Rodriguez, F., de la Cruz M.D.I., Juarranz A., Carrasco E., van Veggel F.C.J.M., Bovero E., Garcia Sole J., and **Jaque D.** "Neodymium-Doped LaF<sub>3</sub> Nanoparticles for Fluorescence Bioimaging in the Second Biological Window" Small 10, 1141 (2014). 157 citations.

**7.- Jaque D.**, Richard C., Viana B., Soga K., Liu X., and Garcia Sole J.G. "Inorganic nanoparticles for optical bioimaging" *Advances in Optics and Photonics* 8, 1-103 (2016). 127 Citations.

**8.-** Dong N., Pedroni M., Piccinelli F., Conti G., Sbarbati A., Enrique Ramírez-Hernández J., Martínez Maestro L., Carmen Iglesias-de la Cruz M., Sanz-Rodríguez F., Juarranz A., Chen F., Vetrone F., Capobianco J.A., García Solé J, Bettinelli M., **Jaque D.**, and Speghini A. "NIR-to-NIR Two-Photon Excited  $\text{CaF}_2:\text{Tm}^{3+}, \text{Yb}^{3+}$  Nanoparticles: "Multifunctional Nanoprobes for Highly Penetrating Fluorescence Bio-Imaging." *ACS Nano*. 5, 11, 8665–8671 (2011). 394 citations.

**9.-** Rodriguez Sevilla P., Zhang Y., Haro-Gonzalez P., Rodriguez Sanz F., Garcia Solé J., Liu X., and **Jaque D.** "Thermal Scanning at the Cellular Level by an Optically Trapped Upconverting Fluorescent Particle" *Advanced Materials*. 28, 2421 (2016). 79 citations.

**10.-** Clayton Ximendes E., Queiroz Santos W., Rocha U., Kumar Kagola U., Francisco Sanz-Rodríguez, Fernández N., Artur da Silva Gouveia-Neto, Bravo D., Martín Domingo A., del Rosal B., Brites C.D.S., Dias Carlos L., **Jaque D.**, Jacinto C. *Nano Letters* 16, 1695 (2016).

## Projects

Participation in more than 30 research projects. The 10 most representative are listed next:

**1.-** "Super bright nanoparticles for the study of nervous system" Funded by: Ministerio de Ciencia e Innovacion. Ref: PID2019-106301RB-I00. PI: Daniel Jaque and Nuria Fernández. June 2020- December 2022. Budget: 477 k€.

**2.-** "Nanoparticles-based 2D thermal bioimaging technologies" Supported by ERC (FET-OPEN project). Coordinator: Luis Carlos. PI@ UAM and IRYCIS: Daniel Jaque. 3.000.000 €

**3.-** "Red Madrileña de Nanomedicina en Imagen Molecular" Project Funded by Comunidad Autónoma de Madrid. Ref: B2017/BMD-3867. General coordinator: Manuel Desco. PI at UAM: Daniel Jaque. Jan 2018-Dec 2021. Budget: 1.020.100 €.

**4.-** "Lanthanide ions doping of ternary quantum dots" Founded by European Commission. H2020-MSCA-IF-2016 Ref: 750926. Coordinator: D. Jaque. 158.000 €

**5.-** "Nanomaterials for cardiovascular imaging" Project funded by the Ministry of Science and Innovation. Reference MAT2016-75362-C3-1-R. Principal Investigator: Daniel Jaque. January 2017-December 2019. . Budget: 225 k €.

**6.-** "Multifunctional nanostructures for controlled imaging and thermal therapy" Project funded by the Ministry of Science and Innovation. Reference MAT2013-47395-C4-1-R. Principal Investigator: D. Jaque. January 2014-December 2016. . Budget: 203 k €.

**7.-** "Lanthanide Ion Doping Of Ternary Quantum Dots" Marie Curie Fellowship Project 797945 (LANTERNS). Coordinator: D. Jaque. Beneficiary: Riccardo Marin. (2019-2021). . Budget: 160 k€

**8.-** "The European upconversion network - from the design of photon-upconverting nanomaterials to biomedical applications" Supported by: EU, Ref.: CMST COST Action CM1403. Principal Investigator: Dr Hans-Heiner GORRIS (coordinator). Principal Investigator UAM: D. Jaque. Budget: 98 k€. 2015-2018.

**9.-** "Upconversion luminescent nanoparticles Novel diagnostic and therapeutic nanomedicine fr "Curie Fellowship IOF Project 274,404 (LUNAMED). Coordinator: D. Jaque. Beneficiary: Emma Martín. 2011-2014. Budget: 120 k €

**10.-**"Luminescent inorganic nanoparticles for optical imaging in fluids and biological systems" Project funded by the Spanish Ministry of Science and Innovation. MAT2010-16161 references. Principal Investigator: D. Jaque. January 2011-December 2013. Budget: 150k €

## Patents.

**1.-** "Laser blue based on the sum of frequencies and intracavity laser pumping Nd: YAB pumping diode or a laser Sapphire Titanium". Co-Inventors: D.Jaque, J.Capmany, F.Molero and J.García Solé. Patent No.: p9801518.

**2.-** "Solid state laser pumped by a laser diode with control state of polarization of the emitted radiation, by varying the cavity length." Co-inventors: J. García Solé, D.Jaque, F. Molero and Member of the research team of the R&D project for Research Results Transfer Stimulus (PETRI) entitled "Development of a solid-state laser cavity self-bending frequency pumped by laser diodes (Ref. 95-0192-OP) and funded by THE CICYT in 1998.J.Capmany. Patent No.: p9900715.

**3.-**“Use of a composition based on a combination of fluorescent nanoparticles”. Presented date: 28/03/2017 (OEPM) (Patent number: P201730451). Approved: 27/06/2019. Authors: Moyano Rodríguez, E.; Caamaño Fernández, A.J.; Rojo Álvarez, J.L.; Ramos López, F.J.; Ramiro Bargueño, J.; de la Peña-O’Shea, V.A.; Jaque García, D.

**4.-** “Nanopartículas de Ag<sub>2</sub>S súper fluorescentes en la región del infrarrojo cercano y método de obtención.” Presented to the Spanish Office of Patents and Trademarks (20019). Patent number: 201900006. Authors: Harrisson Santos, Diego Méndez Gonzalez, Jorge Rubio Retama and Daniel Jaque.

#### **Participation in knowledge-transfer projects. .**

**1.-** Member of the research team of the R&D project for Research Results Transfer Stimulus (PETRI) entitled "Development of a solid-state laser cavity self-bending frequency pumped by laser diodes (Ref. 95-0192-OP) and funded by THE CICYT in 1998.

**2.-** “New fabrication techniques of waveguides for their implementation in ceramic elements.” FGUAM-UAM: 206601 Reference: 20120811. December 2012-February 2013. In cooperation with Industrial Group BSH. Budget: 11 k€. Principal Investigator: Ginés Lifante.

#### **Editorial activity.**

Editor of the journal Optics Express of the Optical Society of America (July 2008- December 2009).

Associate Editor of the journal Optical Materials of Elsevier. (January 2016 September 2018).

Associate Editor of Physica B of Elsevier (June 2019-present.)

#### **Scientific committee membership.**

Member of the Research Committee of the Ramón y Cajal Institute of Health Research (IRyCS) 2014-2018.

Member Management Committee of several COST1006 action (Chemistry and Molecular Sciences and Technologies (European F-Element Network).

Member of the Scientific Committee of the International Conference on Luminescence (ICL). Elected as president from 2021.

#### **Books and chapters.**

**1.-** “Facile and fast synthesis of lanthanide nanoparticles for bio-applications” Tasso O. Sales, Erving C. Ximendes, Daniel Jaque, and Carlos Jacinto. Capítulo publicado en el libro “Nanocomposites for photonic and electronic applications” Edited by Elsevier. ISBN: ISBN: 978-0-12-818396-0. Year: 2019.

**2.-** “Quantum dot fluorescence thermometry” Daniel Jaque y José García Solé. Capítulo publicado en el libro “Thermometry at the Nanoscale: Techniques and Selected Applications” Edited by Royal Society of Chemistry. ISBN: 978-1-84973-904-7. Year: 2016.

**3.-** “Problemas Resueltos de Fundamentos de Física (I)” Gines Lifante, David Bravo, Daniel Jaque, José Emilio Prieto, Iñigo Aguirre de Cárcer. Edited by Universidad Autónoma de Madrid. ISBN: 8483444801. Year: 2015.

**4.-** “An introduction to Optical Spectroscopy of Solids” J. García Solé, L.E. Baussa and D.Jaque. Willey&Sons. ISBN: 9780470016046. Year: 2005.

**5.-** “Trivalent rare earth ion based non linear laser crystal” J.García Solé, J.Capmany, H.Loro, D.Jaque, A.Lorenzo and L.E.Bausá. Capítulo publicado en el libro “Rare Earths” editado por “Editorial Complutense”. ISBN :84-89784-33-7. Year: 1998.