

Candidate application to the ISGS Board of Directors

Prof. Ana Clara Marques

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CV with main research interests (no longer than 1/2 page)

Ana C. Marques is Assistant Professor of the Chemical Engineering Department at Instituto Superior Técnico (IST), Lisbon, Portugal, since 2017, and belongs to the research unit CERENA. She graduated in Materials Engineering from IST in 2000 and obtained her Ph.D. degree in Materials Sci. & Eng. from the same institution in 2005, with a thesis entitled “Erbium/silver glass matrix nanocomposites by sol-gel processing, for integrated optics”. She was a Post-Doc at the International Materials Institute for New Functionality in Glass of Lehigh University, USA, in 2006-2007, working on sol-gel derived nano/macroporous bone tissue scaffolds for regenerative medicine, which resulted in a granted patent US8277829B2. After that, she joined the chemical company Dow Corning in Belgium, as an R&D Chemist, in 2007. At Dow Corning, she was the leader of R&D projects, aiming at new chemical products development (e.g. halogen-free flame retardant additives) for large-scale production, including new silanes and siloxane resins.

In 2014, while holding a FCT Post-Doc grant, she started at IST a Technology Platform on Microencapsulation and Immobilization (<http://web.tecnico.ulisboa.pt/ana.marques/SiteTPMI/>), her main current research interest, aimed at customized solutions for enabling functionalized, active materials and advanced products. As an example, one can refer the MICROSCAFS, sol-gel derived multicomponent oxide microspheres with tailored interconnected macroporosity, which are being applied for environmental remediation, and gave rise to a Best poster award at the XX Conference on Sol Gel Science and Technology, Saint Petersburg (2019).

11 international patents and more than 58 papers (h-index=17) have resulted from her work in the academia and collaboration with the industry. She is currently (2022) PI of 4 R&D projects

(FCT and ANI funding) with a total funding of more than 600K euros to IST, co-PI of a FCT project, and co-supervisor of 8 Ph.D. students and 3 Post-Doc fellows. She was Member of the Executive Committee of the Research Unit of IST, CERENA (2017-2019), she was distinguished for Excellence in Teaching (2020/2021) and is currently Mobility Coordinator for Materials Engineering at IST. She joined the group of Prof. Markus Niederberger at the Department of Materials at ETH Zürich (Switzerland) as an Academic Guest from April to July 2019. She is currently PI of a national funded R&D project, the “Solar2Clean – Engineered solar light driven photocatalytic systems for wastewater purification”, which resulted from such collaboration.

5 representative publications

- Ana C. Marques, Mário Vale, Daniel Vicente, Murielle Schreck, Elena Tervoort, Markus Niederberger, “Porous Silica Microspheres with Immobilized Titania Nanoparticles for In-Flow Solar-Driven Purification of Wastewater”, *Global Challenges* (2021), 2000116, DOI: <https://doi.org/10.1002/gch2.202000116>
- Ana C. Marques, Rocio E. Rojas-Hernandez, Rui M. Almeida, “Optical spectroscopy methods for the characterization of sol-gel materials”. *J Sol-Gel Sci Technol*, 100 (2021) 1-43. <https://doi.org/10.1007/s10971-021-05592-0>
- Mário Vale, Mónica V. Loureiro, M. João Ferreira, Ana C. Marques, “Silica-based Microspheres with Interconnected Macroporosity by Phase Separation”, *J Sol-Gel Sci Technol*, 95 (2020) 746-759; doi: 10.1007/s10971-020-05257-4
- Mónica V. Loureiro, Mário Vale, Aster De Schrijver, João C. Bordado, Elisabete Silva, Ana C. Marques, “Hybrid custom-tailored sol-gel derived micro scaffold for biocides immobilization”, *Microporous and Mesoporous Materials*, 261 (2018) 252 – 258. DOI: <https://doi.org/10.1016/j.micromeso.2017.10.056>
- Ana C. Marques, Himanshu Jain, Carol Kiely, Kai Song, Christopher J. Kiely and Rui M. Almeida, “Nano/macroporous monolithic scaffolds prepared by the sol-gel method”, *J Sol-Gel Sci Technol* 51 (2009) 42–47. DOI: 10.1007/s10971-009-1960-z

Statement of interest

Dear ISGS members,

I hereby express my willingness to contribute as a member of the ISGS Board in support of the international sol-gel community. What compels me, besides my passion for sol-gel science and technology, is the variety of opportunities that I have embraced where I used sol-gel as an enabling chemical route for desired materials, both at the academic and industrial level. I believe I may bring a new breath for the ISGS BoD, due to the experience and vision I have acquired while working for a world leader silanes producer (Dow Corning, Belgium) and while applying silanes and other metal alkoxides in an academic context, at the national and international level, always in the framework of R&D projects, with industrial partners and targeting real applications. Effective communication among scientists and engineers from Academia and Industry is essential for pushing forward the frontiers of sol-gel, and allowing an effective technology transfer and scale-up of sol-gel technologies.

I gave my first steps on sol-gel during an internship at the lab of Dr. Alicia Durán, while still a Materials Engineering student, more than 20 years ago. Then I had the chance to make my Ph.D. in the lab of Prof. Rui Almeida, and a few years later, in 2019, already as Assistant Professor at IST and with a sabbatical leave, I worked at the lab of Prof. Markus Niederberger, as Academic Guest. These were enriching experiences at different stages of my career. So, I strongly agree that researchers, mainly early career researchers, should have the opportunity to work in different labs and go outside their comfort zone. Build their network and, hopefully, successful project

consortia. So, I would like to promote networking among the different labs with activities in sol-gel, including short term stays. The ISGS website might play an important role in this purpose. Training schools, e-seminars, e-masterclasses, i.e., initiatives to build knowledge within the new generations of sol-gel scientists have been in place, and, in my opinion should be more often. Also, whenever possible, the sponsoring by companies should be enforced and Industry Prizes should be sought.

If appointed, I will be proud to contribute to the mission of the ISGS and highly motivated for this task. I believe that my engagement in one more professional challenge, such as the ISGS BoD, may further inspire young women in science for pursuing a career in sol-gel science, and, of course, also the researchers within my group to whom I dedicate most of our successes at the lab.