INTERNATIONAL SOL-GEL SOCIETY

ISGS

materials through chemistry

Candidate application to the ISGS Board of Directors

Dr. Sophie Senani

Age: **44**

Affiliation: **SAFRAN TECH**

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Researcher in Multifunctional Coatings and Nanomaterials

-High Performance Coatings & Surface Engineering
-Multi-functional & Hybrid O/I Materials, Nanotechnology
- Translator between Customer needs and R&D Teams

Work Experience

Researcher -	From 2018	**Safran Tech** – *Innovative Functional Coatings and Processes for Aeronautic Equipments*
Scientific Expert	From 2017	**ANR French National Research Agency** – *Scientific Evaluation Comitee for "Nanomaterials & Nanotechnologies for the Products of the Futur"*
Scientific Expert	From 2019	**Solar Impulse Foundation**– *Environmental Footprint and Economical Evaluation of Ecological and Technological Solutions*
R&D Project Leader	2007-18	**Airbus Group Innovations** – *Innovative Functional Coatings and Processes for Aeronautic*
Post-Doctoral positions	2006	**LI2C-UPMC** *Magnetic Nanoparticules Synthesis & Functionnalisation for immunodiagnostic tests*
	2005-06	**Alcatel**– *Rare-Earth doped Alumine and Antimony Nanoparticles for optical fibers*
PhD and DEA	2000-04	**Rhodia - Laboratoire de Chimie de la Matière Condensée de Paris** (LCMCP-UPMC) *Grafting of organosilanes on SiO_2 surfaces by sol-gel chemistry in aqueous medium and NMR Study*

Skills

Multi-Functional Materials Development	- Functional Thin Films, *Stimuli*-sensitive materials (temperature, pressure), Anticorrosion, Anti-icing, Anti-erosion, Fire protection, Biocide Coatings - Wet & Dry Surface Treatments and Engineering (Spray, Paints, Dip- or Spin-coating, Thermal Spray), Spray-drying, Automation, Prototypes and large scale demonstrators - Drug delivery, Inhibitors' encapsulation, Colloidal science, Particles' synthesis and functionalization,
Chemical Formulation & Process Development	- Sol-Gel films and nanoparticules, nanobuilding-blocks, mesoporous materials, , colloidal and hydrothermal synthesis, functionalization of surface's particules, aerogels, xerogels, - REACH regulation, Environmental compliant materials
Transfer of knowledge	- Since 2012 lessons to Master students at the UPMC PVI and Polytech Paris School **- Member of the ISGS since 2008 -** Scientific Reviewer for Scientific Journal - Participation to the **Scientific Evaluation Councils** MATISSE LABEX and to the COST HINT (*Hybrid Interfaces*) **Industrial Advisory Board**

5 representative publications

- *Hybrid piezochromic coatings for impact detection on composite substrates for aeronautic* Q. Morelle, S. Senani, L. Nicole, M. Gaudon, L. Rozes, E. Le Bourhis, Material Letters, **2019**, *in Press*

- *Potentiality of UV-Cured Hybrid Sol-Gel Coatings for Aeronautical Metallic substrates Protection,* S. Senani, E.Campazzi, M. Villatte, C. Druez, Surface & Coatings Technology, **2013**, 227, 32-37

- *Mesostructured Coatings Comprising a Specific Texture Agent for Application in Aeronautics and Aerospace* E. Campazzi, S. de Monredon, F. Ribot, L. Nicole and C. Sanchez, EADS France- UPMC–CNRS FR29229622; WO/**2009**/136044, (2009)

- *Covalent grafting of organoalkoxysilanes on silica surfaces in water-rich medium as evidenced by ^{29}Si NMR*, S. de Monredon–Senani , C. Bonhomme, F. Ribot, F. Babonneau, J Sol-Gel Sci Technol **2009,** 50:152–157

- *Hydrothermal synthesis of large maghemite nanoparticles: influence of the pH on the particle size,* O.Horner S.Neveu, S. de Montredon, J-M. Siaugue, V. Cabuil, J Nanopart Res **2009** 11:1247–1250

Statement of interest

You might ask yourself: *What curious idea for an industrial to apply to become an ISGS Board Member !*
The reality is that, like Obelix, "I fell in the Sol-Gel Potion" 20 years ago.. This is why **I the Sol-Gel community is my scientific family**.

During the past 20 years, my research was centered on sol-gel formulations' development for a wide range of applications: my journey begun with the synthesis and surface functionalisation of nanoparticles for glass coatings, optical fibres doping, and medical imaging as well as some fundamental understanding about precursors' hydrolysis-condensation onto a nanoparticle's surface. I then used this knowledge to develop innovative Sol-Gel chemistries for protective coatings on aeronautical structural parts as part of Airbus Innovation. For example, NNB and mesoporous materials for environmentally-friendly corrosion protection of Aluminium alloys and *stimuli*-sensitive coatings to detect shock and over-heating in Carbon-Fibre Reinforced Polymer Composites. For the last 18 months, I extended my research activity, as part of the Safran Group, to coatings on more challenging aeronautic equipments, including engines, landing gears, or aircraft's nacelles.

Moreover, I always have been working **closely with great academic and industrial teams over the world**. They taught me how to manage interests of both sides: developing amazing materials, answering key scientific questions and enhancing Sol-Gel Science, all this, while maturing the technology towards final applications to improve daily-life. I am used to say that **"Sol-Gel Science & Technology" is not magical but rather like "Pâtisserie"**. It seems so easy to implement, but needs very accurate and thorough know-how to reach the targeted material's functionality. I would like to heighten this role as a "bridge" between Universities and Industries.

Another key interest for me is to ensure the continuity of our Community is by transferring the knowledge to the new generations of sol-gel scientists. In the continuity of this pathway and in the path of previous ISGS Boards who succeed in few years to give birth to an important new domain of chemistry, I will really be proud to contribute to the Mission of the ISGS.

Finally I wish to increase, my contribution to the promotion of the Sol-Gel Science and Technology as a potential answer to some of the critical environmental challenge of our era. I believe that Sol-Gel Technology can be a part of the answer by being recognised as a fully **"Ecofriendly-Chimie Douce"**.

To wrap-up, I hope you will give me your confidence to represent the whole Sol-Gel Community and continue to promote, following the course set by previous Boards: High Scientific level with a lot of Fun !