

## Rémi Bérard, PhD

Address : Appt. B42, 9 rue Jean Rodier,  
31400, Toulouse, France

Phone: +33 645 285 827

Mail: [Remi.Berard@outlook.fr](mailto:Remi.Berard@outlook.fr)

Web: [remiberard.fr](http://remiberard.fr)

ORCID: 0000-0002-2332-1371



---

### Curriculum Vitae

---

#### Research Expertise

Nanomaterials/Nanoparticles, characterisation and synthesis, plasma chemistry, hydrothermal synthesis, laboratory astrophysics, physico-chemical mechanisms, surface interaction.

#### Education

2016-2019

**PhD**, Research Institute in Astrophysics and Planetology (IRAP) and Laboratory on plasma and conversion of energy (LAPLACE), Toulouse (FR)

*Formation and growth by plasma of laboratory stardust analogues: investigation of the role of the C/O ratio and metals*

*Supervisors: Dr Christine Joblin (IRAP) & Dr Kremena Makasheva (LAPLACE)*

2015-2016

**Master's degree**, Bordeaux University (FR), Chemistry and Physico-Chemistry.

2013-2016

**Master's degree in Engineering**, Graduate School of Chemistry Biology and Physics, Pessac (FR)

*Major in physical chemistry applied in Nano and micro technologies.*

#### Research Experiences

**P4F-MSCA cofund**, October 2024 – Actual

Hilase Center, Institute of Physics of the Czech Academy of Sciences, Prague (CZ), RAYLEIHLAB project. *Refined ablation yield and nanoparticle synthesis by temporally and spatially shaped laser beams.*

**Postdoctoral researcher**, November 2023 – September 2024

LAPLACE, CNRS, Toulouse (FR), ANR GROWNANO project. *Iron and Iron Oxide nanoparticles synthesis by PECVD and PVD in plasma embedded in organosilicon matrix.*

**Postdoctoral researcher**, November 2021 – August 2023

Nanosciences et Innovation pour les Matériaux, la Biomédecine et l'Énergie/Commissariat à l'énergie atomique et aux énergies alternatives (NIMBE/CEA) and laboratoire de Chimie de la Matière Condensée de Paris/Sorbonne University (LCMCP/SU), Paris (FR), ANR-ACETONE project.

*Hydrothermal synthesis and aging of TiO<sub>2</sub> nanoparticles in interaction with H<sub>2</sub>PO<sub>4</sub><sup>-</sup>.*

**Postdoctoral researcher**, October 2019 – March 2020

IRAP and LAPLACE, CNRS, Toulouse (FR), ERC synergy Nanocosmos project. *Investigation of the role of C/O ratio and metal in plasma dust formation.*

**PhD student**, September 2016 – September 2019

IRAP and LAPLACE, CNRS, Toulouse (FR), ERC synergy Nanocosmos project  
*Investigation on plasma dust formation with application for astrophysics studies.*  
Supervisors: Christine Joblin (IRAP) & Kremena Makasheva (LAPLACE)

**Master's degree internship**, March 2016 – September 2016

Centre de Recherche Paul Pascal (CRPP), Bordeaux (FR).  
*Patchy silica nanoparticles synthesis, characterization and assembly by colloidal techniques.*  
Supervisors : Dr. Serge Ravaine and Pierre-Etienne Rouet (PhD student)

## Grants

2024: P4F-MSCA COFUND, RAYLEIHLAB Project

## Teaching activities

**Teaching labs demonstrator in physical chemistry**, 2018

École Nationale Supérieure des Ingénieurs en Arts Chimiques et Technologiques (ENSIACET),  
Toulouse (FR)

---

## ***Publications***

---

### **PhD thesis:**

R. Bérard, “Formation and growth by plasma of laboratory stardust analogues: investigation of the role of the C/O ratio and metals”, University of Toulouse: Paul Sabatier, 2019. Full text (French) available at : <http://thesesups.ups-tlse.fr/4498/>

### **Articles**

**R. Bérard**, C. Sassoïe, H. Terrisse, B. Humbert, P. Bertoncini, S. Cassaignon and S. Le Caer, “Effect of crystalline phase and facet nature on the adsorption of dihydrogen phosphate anions onto TiO<sub>2</sub> Nanoparticles”, *Langmuir*, 2024, *In preparation*

**R. Bérard**, V. Garofano, C. Joblin, L. Stafford and K. Makasheva, “Layer-by-layer fine structuring of plasma synthesized organosilicon nanoparticles and their decoration by Ag-nanograins taking the advantage of cyclic nanoparticle formation in Ar/HMDSO reactive plasmas”, *Nanoscale*, 2024. *In preparation*

**R. Bérard**, K. Makasheva, K. Demyk, A. Simon, D. Nuñez Reyes, F. Mastroiocco, H. Sabbah and C. Joblin, “Impact of Metals on (Star)Dust Chemistry: A Laboratory Astrophysics Approach”, *Frontiers in Astronomy and Space Sciences*, 8, 34 2021.

V. Garofano, **R. Bérard**, X. Glad, C. Joblin, K. Makasheva, and L. Stafford, “Time-resolved analysis of the precursor fragmentation kinetics in an hybrid PVD/PECVD dusty plasma with pulsed injection of HMDSO”, *Plasma processes and polymer*, 16(11), 1900044, 2019.

V. Garofano, **R. Bérard**, S. Boivin, C. Joblin, K. Makasheva, and L. Stafford, “Multi-scale investigation in the frequency domain of Ar/HMDSO dusty plasma with pulsed injection of HMDSO”, *Plasma Source sciences and technology*, 28(5), 055019 (16pp), 2019.

### **Proceedings**

**R. Bérard**, K. Makasheva, H. Sabbah, K. Demyk and C. Joblin, “Using cold plasma to investigate the mechanisms involved in cosmic dust formation: role of the C/O ratio and metals,” *Proceedings IAU Symposium No. 350*, 2019.

### **Oral presentations in conferences:**

**R. Bérard**, F. Gaboriau, H. Sabbah, C. Joblin and K. Makasheva, « Plasma based method for synthesis of iron-containing nanoparticles and their protection through incorporation in organosilicon matrix », *IEEE-International Conference on Nanotechnology*, July 8<sup>th</sup> –11<sup>th</sup>, 2024, Gijón, Spain.

**R. Bérard**, C. Sassoïe, P. Bertoncini, B. Humbert, H. Terrisse, S. Cassaignon and S. Le Caer, « Phosphate ions interactions with TiO<sub>2</sub> nanoparticles: effect of the shape, crystallinity, and oxidative stress », *C’Nano*, 15-17 Mars, 2023, Poitier, France

**R. Bérard**, V. Garofano, C. Joblin, K. Demyk, L. Stafford, and K. Makasheva, « Synthèse par plasma réactif de nanoparticules diélectriques décorées de nanograins d’argent », *6<sup>e</sup> Atelier du IRN « Nanomatériaux Multifonctionnels Contrôlés – NMC*», may 22<sup>th</sup> –24<sup>th</sup> 2019, Jouvence, Canada.

**R. Bérard**, K. Makasheva, H. Sabbah, K. Demyk and C. Joblin, “Using cold plasma to investigate the mechanisms involved in cosmic dust formation: role of C/O ratio and metals,” *First International*

*Astronomical Union Symposium on Laboratory Astrophysics, IAUS 350: Laboratory Astrophysics: from Observations to Interpretation*, April 14<sup>th</sup> -19<sup>th</sup>, 2019, Cambridge - UK.

**R. Bérard**, K. Makasheva, H. Sabbah, and C. Joblin, « Probing the impact of the C/O ratio and metals on the properties of dust particles in a cold plasma reactor », *Physique et Chimie du Milieu Interstellaire (PCMI)*, June 25<sup>th</sup> –29<sup>th</sup>, 2018, Marseille, France.

## Poster

H. Bizeray, **R. Bérard**, A. Belinger, S. Dap, F. Fanelli, N. Naude, *IEEE-International Conference on Nanotechnology*, July 8<sup>th</sup> –11<sup>th</sup>, 2024, Gijón, Spain.

**R. Bérard**, P. Bertoncini, E. Gautron, S. Cassaignon, C. Sassoie, B. Humbert, H. Terrisse, S. le Caer, P. Moreau, *18<sup>ème</sup> Colloque de la société Française des Microscopies*, July 3<sup>rd</sup> – 7<sup>th</sup>, 2023, Rouen, France

**R. Bérard**, V. Garofano, L. Stafford, H. Sabbah, K. Demyk, K. Makasheva, and C. Joblin, *Cosmic Dust: origin, applications & implications (CPHDUST 2018)*, June 11<sup>th</sup> –15<sup>th</sup>, 2018, Copenhagen, Denmark.

V. Garofano, **R. Bérard**, S. Boivin, C. Joblin, K. Makasheva, and L. Stafford, *19<sup>th</sup> International Congress on Plasma Physics (ICPP)*, June 4<sup>th</sup>–8<sup>th</sup>, 2018, Vancouver, Canada.

V. Garofano, **R. Bérard**, L. Stafford, C. Joblin, and K. Makasheva, *XXXIII ICPIG*, July 9<sup>th</sup> -14<sup>th</sup>, 2017, Estoril/Lisbon, Portugal.

**R. Bérard**, M. Carlos, V. Garofano, H. Sabbah, K. Demyk, L. Stafford, K. Makasheva, and C. Joblin, June 12<sup>th</sup> -16<sup>th</sup>, 2017, Toulouse, France.

V. Garofano, **R. Bérard**, L. Stafford, B. Despax, C. Joblin, and K. Makasheva, *Colloque Plasma-Québec*, May 17<sup>th</sup> -18<sup>th</sup>, 2017, Montréal, Québec, Canada.

K. Makasheva, L. Stafford, **R. Bérard**, V. Garofano, F. Gaboriau, H. Sabbah and C. Joblin, *Troisième Atelier « GDRI-NMC »*, December 8<sup>th</sup>-9<sup>th</sup> 2016, Toulouse, France.

**R. Bérard**, V. Garofano, C. Joblin, H. Sabbah, K. Demyk, L. Stafford, and K. Makasheva, *European Conference of Laboratory Astrophysics (ECLA 2016)*, November 21<sup>th</sup>–25<sup>th</sup>, 2016, Madrid, Spain.

## Public outreach

**R. Bérard**, “Des petits atomes aux petites poussières : danse avec les étoiles.” Regional final, for the « My thesis in 180 seconds » contest, March 25<sup>th</sup>, 2019, Toulouse – France. A 3 min French speech on public available on YouTube : [Link](#)