

PERSONAL INFORMATION

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EDUCATION

1985-1989 PhD in physical chemistry, University of Birmingham, UK (supervisor: Ian WM Smith: 'State selected kinetics of CN radical reactions')
1982-1985 BA/MA Natural Sciences, University of Cambridge, UK (St John's College)

CURRENT POSITION(S)

2011- Professeur des Universités Classe Exceptionnelle (Distinguished professor)
2007-2011 Professeur des Universités Première Classe (Full professor)
2003-2007 Professeur des Universités 2ème Classe (Professor) at the Université de Rennes 1, Rennes, France (CNU section 30)

PREVIOUS POSITIONS AND FELLOWSHIPS

1998-2003 Lecturer and Senior Lecturer (2001-) in Physical Chemistry at the School of Chemistry, University of Birmingham, UK
1993-1998 EPSRC Advanced Fellow at the School of Chemistry, University of Birmingham, UK
1991-1993 EU Postdoc / CNRS "Poste Rouge" at the Université de Rennes 1, France (Dr B.R. Rowe)
1989-1991 SERC-NATO Fellowship in the group of Professor Ahmed Zewail, Caltech, Pasadena, USA

AWARDS

2016-2022 Awarded **ERC Advanced Grant** (2.1 M €) for project CRESUCHIRP: Ultrasensitive Chirped-Pulse Fourier Transform mm-Wave Detection of Transient Species in Uniform Supersonic Flows for Reaction Kinetics Studies under Extreme Conditions
2012-2016 Award for Scientific Excellence (Prime d'Excellence Scientifique, P.E.S.)
2004-2008, 2008-2012 Award for Research and Thesis Direction (Prime d'Encadrement Doctoral et de Recherche, P.E.D.R.)
2013-14 6-month Research Sabbatical (CRCT) awarded by the University of Rennes 1
2008-13 3 × 6 month Research Sabbaticals (Délégations) awarded by the CNRS (08-09, 11-12, 12-13)
2004-2007 **EU Marie Curie Chair**, held at the Université de Rennes 1 (awarded for project "Cool Chemistry – Chemistry at Extremely Low Temperatures" € 416k)
1993-1998 Awarded EPSRC Advanced Fellowship (held at the University of Birmingham, project "Ultra-Low Temperature Studies of Gas-Phase Reactions")
1989-1991 SERC-NATO fellowship to work with Prof. Ahmed Zewail (Nobel Prize, Chemistry, 1999)

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2003-2022 Supervised 10 past PhD students and 8 past postdoctoral fellows – Institut de Physique de Rennes, Université de Rennes 1, France (+2 PhD students in 6-12 month visits from Caltech). Currently supervising 1 postdoc and 1 PhD student.
1994-2003 Supervised 3 / co-supervised 3 PhD students; Directed 1 / co-directed 3 postdoctoral fellows – School of Chemistry, University of Birmingham, UK.

TEACHING ACTIVITIES

2015- Joint coordinator of new Master in Engineering Physics (Cursus Master en Ingénierie)
2003- Lectures, tutorials and practical classes in physics (in French and English) at all levels from L1 to M2 and doctoral level.
1993-2003 Lectures, tutorials and practical classes in physical chemistry at all levels.

INSTITUTIONAL RESPONSIBILITIES

- 2016-2022 Member of the Internal Scientific Committee of the Institut de Physique de Rennes
- 2016-2017 **Director of Physical Sciences Doctoral School**, Rennes (SDLM)
- 2010-2016 Assistant Director of Physical Sciences Doctoral School, Rennes (SDLM)
- 2008-2012 Assistant Director of the new Institut de Physique de Rennes (IPR)
- 2006-2008 Member of the Recruitment Committee (Commission de Spécialistes) for Physics at UR1

COMMISSIONS OF TRUST

- 2021-2023 Member of Editorial Advisory Board, The Journal of Physical Chemistry
- 2019-20 **President of Evaluation Committee** (HCERES: *Haut Conseil de l'Evaluation de la Recherche et de l'Enseignement Supérieur*) for LIPHY physics laboratory, Grenoble, France
- 2016- Member **(Chair 2020-)** of **Program Advisory Committee for Interdisciplinary Research (IPAC)** beam time allocation panel for the GANIL accelerator.
- 2014 Member of Evaluation Committee (HCERES: *Haut Conseil de l'Evaluation de la Recherche et de l'Enseignement Supérieur*) for LIPHY physics laboratory, Grenoble, France
- 2014 Member of Chemistry Evaluation Panel for COST (panel meeting in Brussels, Sep 2014)
- 2010- Member of review panel for 'Chemical Dynamics / Gas Phase' program at the Berkeley Advanced Light Source Synchrotron
- 2009 Member of NASA grant panel for Laboratory Astrophysics (Washington DC, June 2009)
- 1997- External examiner (rapporteur) for 10 PhD theses and five HDR (Habilitation) theses
- 1998- Reviewer for numerous grant proposals including EPSRC, ANR, NASA, NSF, ERC, ...
- 1993- Reviews for journals inc Science, Nature Chem., JPC, JCP, PCCP, Angewandte, ApJ, etc

PUBLICATIONS AND PRESENTATIONS

102 publications including 3 refereed proceedings, 4 chapters in edited books and 2 edited books. Articles as corresponding author in the journals **Science** in 2007 and 2010 (articles) and 2011 (Perspective), **Nature Chemistry** in 2013 (News and Views), 2014 and 2022 (articles), **Astrophys. J. Letts.** in 2020, **Phys. Rev. Letts.** in 2010, and **J. Phys. Chem. Letts.** in 2010. Please refer to accompanying document for full list.

4055 citations (excluding self-citations), $h = 39$ (Web of science 10/2022; $h = 45$ Google Scholar)

77 invited lectures and seminars (46 since 2011).

64 contributed lectures and seminars (17 since 2011).

MAJOR COLLABORATIONS AND NETWORKS

- 2017- International Research Network (GDRI) QUADMARTS on QUAntitative Detection of Molecular And Radical Trace Species produced by chemical reactions and photodissociation processes (co-P.I. with S.D. Le Picard P.I. and R. Georges co-P.I.).
- 2015- Mitchio Okumura (Caltech, Pasadena USA) 6 month research visit of Caltech PhD student Laura Mertens in 2015-16: 1 article published, 1 under review on energy transfer at low temperatures for astrophysics. 12 month research visit of Caltech PhD student Joey Messinger funded by NSF GROW + Chateaubriand), 2019–20, 2 articles published.
- 2015- Cecilia Ceccarelli, Paola Caselli and the SOLIS (Seeds of Life in Space) team: participation as expert on chemical reactivity in the gas phase. The SOLIS project aims to understand how, when and where interstellar complex organic molecules (iCOMs) form during the early stages of Solar-type star formation. SOLIS is a NOEMA Large Program. Numerous articles.
- 2012- Arthur Suits (Wayne State, Detroit, USA, now U. Missouri) and Robert Field (MIT, Boston, USA) Development of Chirped-Pulse, FT mm-Wave Pulsed Uniform Supersonic Flow Spectrometer. Joint articles in JCP (two in 2014) and JPC Lett (2015)
- 2012- Millard Alexander (U. Maryland, USA) and François Lique (U. du Havre, France), leading theoreticians in the area of quantum scattering. Joint article in Nature Chemistry (2014)
- 2012-2015 S.R. Leone, K.R. Wilson (UC Berkeley / Lawrence Berkeley Lab, USA) and D.L Osborn, C.A. Taatjes (Sandia National Lab, Livermore CA), France Berkeley Fund 10 k\$, 2 articles.
- 2010- Jean-Claude Guillemin, Ecole Nationale Supérieure de Chimie de Rennes, specialist in

synthesis of unstable compounds of astrochemical interest. Joint EU FEDER grant.

- 2007-2011 R. Kaiser (U. Hawaii, USA), A. Mebel (Florida International U., Miami, USA), A. Suits (Wayne State, Detroit, USA). NSF Collaborative Research in Chemistry program *Titan: Observations, Experiments, Computations, and Modeling* (NSF 100 k\$ to Rennes)
- 2007- S.J. Klippenstein, Argonne National Laboratory, Chicago, IL, USA. SJK is world-leading theoretician in the area of chemical kinetics. Joint articles in *Science* (2007), *J. Phys. Chem. Lett.* (2010), *J. Phys. Chem. A.* (2013)
- 2004-2008 Scientific Director for the Rennes team and President of the Board for the EC Marie Curie Research Training Network *The Molecular Universe*
- 1997-2002 **Network Co-ordinator for EC TMR Research Training Network Astrophysical Chemistry**

MEMBERSHIPS OF EXTERNAL SCIENTIFIC COMMITTEES

RSC/RAS Astrophysical Chemistry Group, Secretary, 2002-2006, Chairman 2006-2010 ; RSC Gas Kinetics Discussion Group, Secretary 2004-2005, Chairman 2006-2007, Member of Steering Committee 2020-; Member of RSC Faraday Council, 2003-2006; Scientific Committee of the CNRS Interdisciplinary Programme 'Origin of Planets and of Life' 2007-2009.; Member of IAU Commission 34 / Division VI - Astrochemistry Working Group, 2009-2015.

15 year track record

Ten representative publications since 2006

The P.I. is a corresponding author on all these.

1. H. Labiad, M. Fournier, L. A. Mertens, A. Faure, D. Carty, T. Stoecklin, P. Jankowski, K. Szalewicz, S. D. Le Picard, and I. R. Sims, *Absolute measurements of state-to-state rotational energy transfer between CO and H-2 at interstellar temperatures*, **Phys. Rev. A** 105 (2022), 6, L020802.
2. B. M. Hays, D. Gupta, T. Guillaume, O. A. Khedaoui, I. R. Cooke, F. Thibault, F. Lique, and I. R. Sims, *Collisional excitation of HNC by He found to be stronger than for structural isomer HCN in experiments at the low temperatures of interstellar space*, **Nature Chemistry** 14 (2022), 811-815
3. T. S. Hearne, O. Abdelkader Khedaoui, B. M. Hays, T. Guillaume, and I. R. Sims, *A novel Ka-band chirped-pulse spectrometer used in the determination of pressure broadening coefficients of astrochemical molecules*, **J. Chem. Phys.** 153 (2020), 084201
4. I. R. Cooke, D. Gupta, J. P. Messenger, and I. R. Sims, *Benzonitrile as a Proxy for Benzene in the Cold ISM: Low-temperature Rate Coefficients for CN + C₆H₆*, **Astrophys. J. Lett.** 891 (2020), L41
5. I. R. Cooke and I. R. Sims, *Experimental Studies of Gas-Phase Reactivity in Relation to Complex Organic Molecules in Star-Forming Regions*, **ACS Earth Space Chem.** 3 (2019), 1109-1134
6. M. Tizniti, S. D. Le Picard, F. Lique, C. Berteloite, A. Canosa, M. H. Alexander, and I. R. Sims, *Measurement of the rate of the F + H₂ reaction at very low temperatures* **Nature Chemistry** 6 (2014), 141-145
7. H. Sabbah, L. Biennier, S. J. Klippenstein, I. R. Sims, and B. R. Rowe, *Exploring the Role of PAHs in the Formation of Soot: Pyrene Dimerization*, **J. Phys. Chem. Lett.** 1 (2010), 2962-2967
8. S. D. Le Picard, M. Tizniti, A. Canosa, I. R. Sims, and I. W. M. Smith, *The Thermodynamics of the Elusive HO₃ Radical*, **Science** 328 (2010), 1258-1262
9. C. Berteloite, M. Lara, A. Bergeat, S. D. Le Picard, F. Dayou, K. M. Hickson, A. Canosa, C. Naulin, J. M. Launay, I. R. Sims, and M. Costes, *Kinetics and Dynamics of the S(¹D₂) + H₂ → SH + H Reaction at Very Low Temperatures and Collision Energies*, **Phys. Rev. Lett.** 105 (2010), 203201
10. H. Sabbah, L. Biennier, I. R. Sims, Y. Georgievskii, S. J. Klippenstein, and I. W. M. Smith, *Understanding reactivity at very low temperatures: The reactions of oxygen atoms with alkenes*, **Science** 317 (2007), 102-105

Invited presentations to international conferences since 2006

Date Meeting

1. 2023 **RSC Faraday joint interest group conference 2023**, Sheffield, UK (Plenary)
2. 2022 **Biennial conference of the National Program "Physics and Chemistry of the Interstellar Medium" (PCMI)**, École Normale Supérieure, Paris, France
3. 2022 **36th Free Radicals Symposium**, Stockholm University, Stockholm, Sweden
4. 2022 **Collisional excitation of (reactive) astrophysical molecules workshop**, St Florent, Corsica, France
5. 2021 **Elucidating the Interstellar and Circumstellar Chemistry of Silicon Symposium, Fall 2021 National ACS Meeting, Atlanta, GA, USA.** (online)

6. 2020 **The Molecular Underpinnings of Astrophysics** – TSRC Workshop – Telluride, CO, USA
7. 2019 Invited seminars at **RIKEN and University of Tokyo** Department of Physics, Tokyo, Japan
8. 2018 **COST Conference: Our Astro-Chemical History**, Assen, Netherlands
9. 2018 **Gordon RC on Molecular Interactions & Dynamics**, Stonehill College, Easton MA USA
10. 2018 **Frontiers of Chemical Dynamics**, Kavli Royal Society Centre, Chicheley Hall, UK
11. 2018 **Hydride chemistry: From earth to space**, Telluride Science Research Center, CO, USA
12. 2017 **Astrochemical conference KIDA2017**, Bordeaux, France
13. 2017 **David Williams 80th Birthday Conference**, Royal Astronomical Society, London, UK
14. 2017 **10th International Conference on Chemical Kinetics**, Chicago, Illinois, USA (Plenary)
15. 2017 **IAU Symposium 332: Astrochemistry VII** – Through the Cosmos from Galaxies to Planets, Puerto Varas, Chile
16. 2016 Physical Chemistry Meets AMO Symposium, **252nd National ACS Meeting**, Philadelphia, Pennsylvania, USA
17. 2016 **Cold And Controlled Molecules and Ions**, Weizmann Institute, Rehovot, Israel
18. 2015 **ICOMET 2015**, Chengdu, China
19. 2015 **Dynamics of Molecular Collisions XXV**, Celebrating 50 Years of Chemical Reaction Dynamics, Asilomar, California, USA
20. 2015 Anharmonicity in medium-sized molecules and clusters, **AMOC 2015**, Madrid, Spain
21. 2014 20th European Conference on Molecular Dynamics, **MOLEC 2014**, Gothenburg, Sweden
22. 2013 **'Chemical Frontiers in Solar System Exploration'** symposium at the 246th **ACS** National Meeting and Exposition, Indianapolis, Indiana, USA
23. 2013 32nd International Symposium on **Free Radicals**, Potsdam, Berlin, Germany
24. 2012 **Gordon** Research Conference on **Atomic and Molecular Interactions**, Stonehill College, Easton, MA, USA
25. 2011 **First European Conference on Laboratory Astrophysics**, Paris, France
26. 2011 **COMET 2011** International Conference on Molecular Energy Transfer, University of Oxford, UK
27. 2011 **7th International Conference on Chemical Kinetics**, MIT, Cambridge, MA, USA
28. 2011 Workshop on **Cold and Controlled Molecular Collisions**, Ringberg Castle near Lake Tegernsee, Germany
29. 2010 COST Action - **The Chemical Cosmos, First Annual Meeting**, Grenoble, France
30. 2010 **Recent Advances in Observational and Experimental Astrochemistry** symposium at 239th **ACS** National Meeting, San Francisco, California, USA
31. 2007 International Astrophysics and Astrochemistry Conference **'Molecules in Space and Laboratory'**, Observatoire de Paris, France.
32. 2006 **Chemistry in Extreme Environments** symposium at **ACS** Meeting, San Francisco, CA, USA
33. 2006 **Nobel Symposium on Cosmic Chemistry and Molecular Astrophysics**, Stockholm, Sweden

Organisation of conferences and workshops (member of SOC or LOC from 2006)

Date	Meeting	Role
2023	<i>Astrochemistry at High Resolution, Faraday Discussion, Space Telescope Science Institute, Baltimore, MD USA</i>	Deputy chair, member of SOC
2022	<i>26th International Symposium on Gas Kinetics and Related Phenomena, Couvent des Jacobins, Rennes, France</i>	Chair of LOC, member of SOC
2019-2020	<i>COSPAR 2020 Pre-biotic and complex molecules in the universe: Observational, laboratory and computational perspectives on the evolution of molecular complexity, Sydney, Australia (postponed)</i>	Member of SOC
2017-	<i>Inaugural, First, Second and Third Annual Network Meetings of the QUADMARTS International Research Network</i>	Co-organiser and member of SOC
2014	<i>Mini-symposium on Spectroscopy in Kinetics and Dynamics, International Symposium on Molecular Spectroscopy, 69th Meeting, Champaign-Urbana, Illinois USA</i>	Co-chair / convenor
2007-2012	<i>Six annual workshops on Titan: Observations, Experiments, Computations, and Modeling in Honolulu, HI, USA (2007); Miami, FL, USA (2008); San Juan, Puerto Rico (2009); St Jacut de la Mer France, (2010); Kauai, HI, USA (2011); Miami, FL, USA (2012)</i>	Member of SOC

2011	<i>The Molecular Universe</i> , IAU Symposium 280, Toledo, Spain	Member of SOC
2010	<i>Chemistry of the Planets</i> , Faraday Discussion 147, St Jacut-de-la-Mer, Bretagne, France	Chair , member of SOC and LOC
2008	<i>20th International Symposium on Gas Kinetics</i> , Manchester, UK	Member of SOC
2007	<i>International Astrophysics and Astrochemistry Conference 'Molecules in Space and Laboratory'</i> , Observatoire de Paris, France	Member of SOC (after being invited to speak!)
2006	<i>19th International Symposium on Gas Kinetics</i> , Orléans, France	Chair of SOC
2006	<i>Chemical Evolution in the Universe</i> , Faraday Discussion 133, St Jacut-de-la-Mer, Bretagne, France (also edited Discussion Volume)	Co-Chair and member of SOC / LOC

Major contributions to the early careers of excellent researchers

2022: Dr Brian M. Hays, Postdoc directed by the PI 2017-2021, appointed as CNRS Researcher (Section 04) at the PhLAM laboratory (CNRS-University of Lille), to start in December 2022.

2021: Dr Ilsa R. Cooke, Postdoc/Marie Curie Fellow directed by the PI 2018-2021, appointed to position of assistant professor at the Department of Chemistry, University of British Columbia, Vancouver, Canada

2007: Dr David Carty, PhD directed by the PI 1999-2003, appointed to joint lectureship in the Departments of Physics and Chemistry of the University of Durham, UK, after postdoctoral fellowships in Berlin (Fritz Haber Institute, Prof. Gerard Meijer) and the University of Oxford (Prof T. Softley).

2011: Dr Hassan Sabbah, PhD directed by the PI 2005-8, is appointed to a lectureship in the Department of Physics at the Université Paul Sabatier, Toulouse, France after a postdoctoral fellowship with Prof R.N. Zare, Stanford University, USA