Cristina Sanz

Curriculum Vitae

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Associate Professor
Department of Applied Physical Chemistry
Autonoma University Madrid (UAM), Spain

Education

2005 **European PhD**,
UAM/Institute of Fundamental Physics (IFF-CSIC)
Supervisors: Prof. Miguel Paniagua Caparrós (UAM), Dr. Octavio Roncero Villa (CSIC)
Title: *Probing ground and excited electronic states of LiHF and CaHCl systems to understand the harpoon mechanisms in collision and photoinitiated processes*

1998 **Bachelor degree in Chemistry**, UAM
Specialisation in Physical Chemistry

Academic/Scientific positions

2019- **Associate Professor**, Dept. Applied Physical Chemistry, UAM. Madrid, Spain

2013-2018 **Assistant Professor**, Dept. Applied Physical Chemistry, UAM. Madrid, Spain

2010-2013 **Researcher under the Spanish National project "CONSOLIDER"**, IFF, CSIC. Madrid, Spain

2010-2013 **Researcher, Engineering and Physical Sciences Research Council Fellowship**, University of Birmingham, United Kingdom

2010-2013 **Researcher, Spanish Ministry of Education and Science Fellowship**, University of Bristol, United Kingdom

2005-2006 **Interim Associate Professor**, Dept. Applied Physical Chemistry, UAM. Spain

Scientific projects (last 5 years)

2025-2028 **Electronic structure, molecular collisions and ultrafast photoinduced processes - PID2024-155352NB-C22**, IPs: Dr. Manuel Lara Garrido and Dr. Alexandre Zanchet, Funded by Spanish Ministry of Science and Innovation

2025-2028 **Innovation in sustainable solid oxide electrolysers for green hydrogen generation - TEC-2024/ECO-121**, IPs: Dr. Sandra Rodríguez González and Alberto Pablo Sánchez Muzas, Funded by the Madrid regional office for education, science and universities

2022-2025 **Interaction potentials of poliatomic systems - PID2021-122549NB-C22**, IPs: Dr. Cristina Sanz Sanz and Dr. Alfredo Aguado Gómez, Funded by Spanish Ministry of Science and Innovation

2018-2021 **Collisions and photodissociation of astrophysics interest in gas phase and ices and surface dynamics - FIS2017-83473-C2-2-P**, IP: Dr. Alfredo Aguado Gómez, Funded by Spanish Ministry of Science, Innovation and Universities

Student supervision

PhD supervision

2023- Co-supervision: Mr Jorge Alonso de la Fuente.
Theoretical studies of Phosphine and its fragments.
Co-supervisor: Dr. Alexandre Zanchet (CSIC)

2022- Co-supervision: Mr Javier Hernández Rodríguez.
Dynamics of spin-forbidden mechanisms
Co-supervisor: Dr. Susana Gómez-Carrasco (USAL)

Master projects supervision (last 5 years)

2023 Co-supervisor of the master project of Mr Jorge Alonso de la Fuente.
Title: *Phosphorous hydrides: where are they in the atmospheres of AGB stars?*.
Co-supervisor: Dr. Alexandre Zanchet

2022 Co-supervisor of the master project of Mr Javier Hernández Rodríguez.
Title: *Dynamics of spin-forbidden reactions*.
Co-supervisor: Dar. Susana Gómez Carrasco

2020 Co-supervisor of the master project of Ms Cristina Ordás González.
Title: *Study of the weak interactions of noble gases adsorbed in PAHs surfaces: comparison between canonical CCSD models and DLPNO variants*.
Co-supervisor: Dr. Daniel Arismendi Arrieta

Undergraduate projects (last 5 years)

2025 Co-supervisor of undergraduate project of Iván Jesús Melero López.
Title: *Exploring quantum effects in nuclear physics through electron spectroscopy*.
Co-supervisor: Dr. Javier Cerezo Bastida

2025 Co-supervisor of undergraduate project of Iván Jesús Melero López.
Title: *Zero carbon emissions target. Tritium, fuel for nuclear fusion with a very special chemistry. Monitoring of Q_2 and CQ_4 through Raman Spectroscopy*.
Co-supervisor: Dr. Deseada Díaz Barrero

2023 Supervisor of undergraduate project of Alejandro Barroso de la Fuente.
Title: *Collision of atomic and molecular systems of astrophysical interest*.

2023 Co-supervisor of undergraduate project of Javier Dueñas Díez.
Title: *Chasing orbitals*.
Co-supervisor: Dr. Jose Luis Pascual Robledo

2021 Supervisor of undergraduate project of Jorge Alonso de la Fuente.
Title: *Inelastic quantum dynamics collisions between the CH^- molecule and He atom under interstellar conditions*.

2021 Co-supervisor of undergraduate project of David Varas Rubio.
Title: *Potential energy surface of Al+O_2*.
Co-supervisor: Prof. Miguel Paniagua Caparrós

2020 Co-supervisora del Trabajo de fin de Grado de Cristina Todorov Nikolaeva.
Título: *Estudio del largo rango en los canales de la superficie de energía potential del sistema OH_2^+*.
Codirector: Prof. Miguel Paniagua Caparrós

Publications (last 5 years)

1. J. Alonso de la Fuente, L. González-Sánchez, E. Yurtsever, C. Sanz-Sanz, R. Wester, M. Satta, and F. A. Gianturco. Quantum dynamics of $C_{10}H^-$ in the interstellar medium: Inelastic collisions with he and formation reaction from the $HC_{10}H/H^-$ reactants. *Phys. Chem. Chem. Phys.*, doi: 10.1039/D5CP02685G, 2025.

2. L. González-Sánchez, C. Sanz-Sanz, S. V. Jerosimić P. del Mazo-Sevillano, K. Dulitz, and F. A. Gianturco. Quantum dynamics and cooling kinetics of BN^- anions via buffer gases in ion traps. *J. Chem. Phys.*, 163:054308, 2025.

3. C. Sanz-Sanz and G.A. Worth. The strong-field control of ibr photodissociation revisited. *Chem. Phys. Phys. Chem.*, 27:16428, 2025.

4. K. Dulitz, S. V. Jerosimić, P. del Mazo-Sevillan, J. Alonso de la Fuente, C. Sanz-Sanz, L. González-Sánchez, and F. A. Gianturco. Laser-optical cycling of cryogenically cooled BN^- molecular anion. *Phys. Scr.*, 100:055411, 2025.

5. C. Sanz-Sanz, B. Mandal, P. G. Jambrina, F. Javier Aoiz, and N. Balakrishnan. Cold collisions of highly vibrationally excited and aligned D_2 with ne. *J. Chem. Phys.*, 162:164307, 2025.

6. P. del Mazo-Sevillano, D. Félix-González, A. Aguado, C. Sanz-Sanz, D.-H. Kwon, and O. Roncero. Vibrational, non-adiabatic and isotopic effects in the dynamics of the $H_2 + H_2^+ \rightarrow H_3^+ + H$ reaction: application to plasma modelling. *Mol. Phys.*, 122:e2183071, 1 2024.

7. J. Hernández-Rodríguez, C. Sanz-Sanz, P. Alberto Enríquez, M. González, and M. Paniagua. Potential energy surfaces for singlet and triplet states of the LiH_2^+ system and quasi-classical trajectory cross sections for H + LiH^+ and H^+ + LiH. *Phys. Chem. Chem. Phys.*, 25:28052, 2023.

8. L. González-Sánchez, E. Yurtsever, J. Alonso de la Fuente, C. Sanz-Sanz, R. Wester, and F. A. Gianturco. Collision-induced state-changing rate coefficients for cyanogen backbones NCN $^3\Sigma^-$ and CNN $^3\Sigma^-$ in astrophysical environments. *Phys. Chem. Chem. Phys.*, 25:30330, 2023.

9. J. Alonso de la Fuente, C. Sanz-Sanz, L. González-Sánchez, E. Yurtsever, R. Wester, and F. A. Gianturco. The $CH^{\breve{}}$ $^3\Sigma^+$ anion: Inelastic rate coefficients from collisions with he at interstellar conditions. *J. Phys. Chem. A*, 127:765, 2023.

10. P. Ortega, S. Gil-Guerrero, L. González-Sánchez, C. Sanz-Sanz, and Pablo G. Jambrina. Spin-forbidden addition of molecular oxygen to stable enol intermediates. decarboxylation of 2-methyl-1-tetralone-2-carboxylic acid. *Int. J. Mol. Sci.*, 24:7424, 2023.

11. J. Alonso De La Fuente, C. Sanz-Sanz, L. Gonzalez-Sanchez, E. Yurtsever, R. Wester, and F. A. Gianturco. The CH^- anion: Inelastic rate coefficients from collisions with he at interstellar conditions. *J. Phys. Chem. A*, 127:55, 1 2022.

12. J. Coonjobeeharry, K. E. Spinlove, C. Sanz-Sanz, M. Sapunar, N. Došlić, and G. A. Worth. Mixed-quantum-classical or fully-quantized dynamics? a unified code to compare methods. *Philos. Trans. Royal Soc. A*, 380, 2022.

13. C. Sanz-Sanz, A. Aguado, and O. Roncero. Near-resonant effects in the quantum dynamics of the $H + H_2^+ \rightarrow H_2 + H^+$ charge transfer reaction and isotopic variants. *J. Chem. Phys.*, 154:104104, 3 2021.

14. P. Ortega, A. Zanchet, C. Sanz-Sanz, S. Gómez-Carrasco, L. González-Sánchez, and P. G. Jambrina. Dpgc-catalyzed peroxidation of 3,5-dihydroxyphenylacetyl-coA (DPA-CoA): Insights into the spin-forbidden transition and charge transfer mechanisms. *Chem. Eur. J.*, 27:1700–1712, 1 2021.

15. O. Roncero, V. Andrianarijaona, A. Aguado, and C. Sanz-Sanz. Vibrational effects in the quantum dynamics of the $H + D_2^+$ charge transfer reaction. *Mol. Phys.*, page e1948125, 7 2021.

16. A. Aguado, O. Roncero, and C. Sanz-Sanz. Three states global fittings with improved long range: singlet and triplet states of H_3^+. *Phys. Chem. Chem. Phys.*, 23:7735–7747, 4 2021.

17. P. Ortega, S. Gil-Guerrero, A. Veselinova, A. Zanchet, L. González-Sánchez, P. G. Jambrina, and C. Sanz-Sanz. Multi- and single-reference methods for the analysis of multi-state peroxidation of enolates. *J. Chem. Phys.*, 154:144303, 4 2021.

Visits to academic institutions

2024 **University College London, United Kingdom**,
Research visit to the group of Prof. Graham A. Worth,
Duration: 3 months

2018 **University of Groningen, Netherlands**,
Research visit to the group of Dr. Shirin Faraji,
Duration: 3 days

2017 **Ruder Boskovic Institute Zagreb, Croacia**,
Research visit to the group of Prof.[a] Nadja Dŏslić,
Duration: 10 days

2009 **National Research Council, Ottawa-Canada**,
Research visit to the group of Prof. Albert Stolow,
Duration: 1 week

2009 **Universidad de Alberta, Canada**,
Research visit to the group of Prof. Albert Stolow,
Duration: 3 weeks

2006 **CNRS, Laboratoire Francis Perrin, France**,
Research visit to the group of Prof. Benoit Soep,
Duration: 1 week

2005 **CNRS, Laboratoire Francis Perrin, France**,
Research visit to the group of Prof. Benoit Soep,
Duration: 3 months

2004 **University of Rome "La Sapienza", Italy**,
Research visit to the group of Prof. Francesco A. Gianturco,
Duration: 1 month

2001-2022 **Radboud University Nijmegen, Netherlands**,
Research visit to the group of Prof. Ad van der Avoird,
Duration: 1 year

International conferences organisation

2026 **High Dimensional Quantum Dynamics (HDQD2026)**,
Organising committee: Cristina Sanz Sanz and Sandra Gómez (USAL),
Venue: Autonoma University Madrid (Spain)
https://hdqd2026.wordpress.com

2019 **10th International Meeting on Atomic and Molecular Physics and Chemistry (IMAMPC2019)**,
Organising committee: Cristina Sanz Sanz, Sergio Díaz-Tendero and Daniel Arismendi Arrieta (DIPC),
Venue: Spanish National Research Council, Madrid (España)
https://imampc2019.wordpress.com

Oral presentations in international conferences (last 5 years)

2025 *Non-ionizing strong-field quantum control: from simplified models to realistic dynamics*
Flagship workshop on the Future directions in non-adiabatic dynamics: towards complex systems and long time scales. Zaragoza (Spain).

2024 *Multi-state coupled driven photodissociation*
High Dimensional Quantum dynamics (HDQD2024). Hamburg (Germany).

2022 *Stark effect control or pulse delayed excitation/de-excitation effect in the photodissociation of IBr molecule?*
High Dimensional Quantum dynamics (HDQD2022). Groningen (Netherlands).

2021 *Control of the dissociation of IBr: Stark effect or pulse delayed excitation/de-excitation effect?*
International Chemical congress of pacific basin societies (PACIFICHEM2021). Hawái (United States of America). Virtual Conference

Other merits

- **Editor of the special issue in Quantum and Classical Molecular Dynamics** - International Journal of Molecular Sciences (MDPI)
- **Reviewer of scientific papers:** Phys. Chem. Chem. Phys., Mol. Phys., Chem. Phys. Lett., Theor. Chem. Acc., Symmetry, Astrophys. J. Lett., Phys. Rev. Lett.
- **Deputy head of the Applied Physical Chemistry (2019 - currently)**
- **PhD committee member**
  9 theses evaluated