Curriculum Vitae

André CANOSA

Date of birth: September 19th, 1965, Researcher ID: N-1709-2014
Place of birth: Lorient (Morbihan – France) Orcid Code: 0000-0001-5719-9899
Single
Nationality: French

Employment and Education

2011-	"Directeur de Recherche 2nd class", UMR 6251 – Institut de Physique de Rennes (IPR), Université de Rennes 1, France
2008-2011	"Chargé de Recherche 1st class", IPR, France
Dec/2005	"Habilitation à Diriger des Recherches" obtained at the "Université de Rennes 1"; examination committee: E. Roueff and D. Gauyacq (referees), F. Spiegelman, M. Costes, JBA Mitchell and B. Rowe.
1996-2007	"Chargé de Recherche 1st class", UMR 6627 – PALMS laboratory, Université de Rennes1, France.
1992-1996	"Chargé de Recherche 2nd class", URA 1203 DPAM laboratory, renamed UMR 6627 PALMS.
1991-1992	Post-Doc at "*Département de Physique Atomique et Moléculaire*" (DPAM) of the "Université de Rennes 1" under supervision of Dr. B. Rowe.
1988-1991	PhD thesis in "Astrophysics and Space Techniques" untitled "*Experimental study of the branching ratios from the dissociative recombination of polyatomic ions with electrons. Measure of the rate coefficient of the dissociative recombination of* O_2^+, N_2^+ *and* H_3^+ *at 300 K*." Defence May 31st, 1991, "Université de Paris VII", superviser: B. Rowe.
12/90-12/91	Military Service as "Scientist", "Institut de Mécanique des Fluides de Luminy", Université de Marseille, (France).
1987-1988	Master on "Astrophysics and Space Techniques", Université Paris VII. Grade: Very Good.

Research

Publications: **77** in peer-reviewed journals and **12** in conference proceedings

Books: editor of the "Dissociative Recombination: Theory, Experiments and Applications"; eds B.R. Rowe, J.B.A. Mitchell, and A. Canosa; Nato Asi Series, **B 313**, Plenum Press New York (1993)
editor of ""“Uniform Supersonic Flows in Chemical Physics: Chemistry close to absolute zero studied using the CRESU method”; eds B.R. Rowe, A. Canosa and D.E. Heard, World Scientific (2021, in press)

Chapters in *Atomic and Molecular Beams: The state of the Art 2000*, p 579-590, ed. R. Campargue, Spinger-Verlag, Berlin, Heidelberg (2001);
in *Low Temperatures and Cold Molecules*, p 55-120, ed. I.W.M. Smith, Imperial College Press, (2008).

in *Uniform Supersonic Flows in Chemical Physics: Chemistry close to absolute zero studied using the CRESU method*, 3 chapters, eds B.R. Rowe, A. Canosa and D.E. Heard, World Scientific (2021, in press).

35 oral presentations given personally including **13 invited lectures**.

H-index: 29 (Web of Science), Citations: 2122 (131/year 2016-2020)

Fields of expertise: Gas Phase Reaction Kinetics, Supersonic Flows, CRESU, Pulsed Lasers, Laboratory Astrophysics, Atmospheric Chemistry, Astrochemistry.

My field of interest is gas-phase reaction kinetics with a special focus on studies in extreme temperature conditions of astrophysical applications. I have used the CRESU technique for more than 20 years to study radical-neutral reactions at very low temperatures (10 – 200 K) and contributed to its development and improvement. I am an expert in Laval Nozzle calculations which represent the heart of the technique and recently I have improved an innovative pulsed CRESU system developed in our laboratory and implemented in the Universidad de Castilla-La Mancha (Ciudad Real, Spain).

Grants (PI): **160** k€: French national programme "Physics and Chemistry of the Interstellar Medium" (2005-2011); **87** k€: French national programme "Planetology" (2000-2011); **67.3** k€: "Conseil Régional de Bretagne", *Regional Maturation Fund* programme (2011-2012); **90** k€ for a PhD fellowship (C. Sleiman 2011-14) and **52** k€ for a half PhD fellowship (A. Grira, 2017-20).

Honours

2018: COST CM1401 "Our Astrochemical History" financial support for a 49 days stay at the "Universidad de Castilla-La Mancha": UCLM (Ciudad Real, Spain), **2.0** k€

2017: Invited Researcher (6 month) at UCLM (Ciudad Real, Spain), **11.6** k€.

2016: COST CM1401 "Our Astrochemical History" financial support for a 2 months stay at UCLM (Ciudad Real, Spain), **2.5** k€

2015: Invited Researcher (5 month) at UCLM (Ciudad Real, Spain), **10.6** k€.

2000: Awarded the European **Prize René Descartes** in collaboration with B. Rowe, Univ. Rennes 1, (Fr); I.W.M. Smith & I.R. Sims, Univ. Birmingham, UK, **60** k€.

1991-1992 Awarded a one year fellowship from the "Société de Secours des Amis des Sciences" Paris (France), **10** k€.

Administration and management of Research

2008-2011 Member of the executive committee of the Institut de Physique de Rennes (Fr).

2005-2011 **Team Leader** of the "*Astrochimie Expérimentale*" group in PALMS laboratory and then "Institut de Physique de Rennes". (25 persons).

2005-2013 **Assistant Director** of the French national programme "Physics and Chemistry of the Interstellar Medium" PCMI.

2003-2007 Member of the executive committee of the PALMS laboratory

1996-2004 Member of the PALMS laboratory board

1996-2008 Member of the recruitment committee (Commission des Spécialistes) for the 29th 30th and 37th sections of Univ. Rennes 1. Vice President of B category members (2005-2008).

Supervisor of 3 phD students (1995-1998; 2011-2014; 2017-2021) and active participation in the training of 10 other phD students.

Examiner or referee for 10 PhD students defences and 4 "Habilitation" (HDR)

Referee for J. Phys. Chem. A, J. Photobiol. and Photochem., Chem. Phys. Lett., Phys. Chem. Chem. Phys., ACS Earth and Space Sci., the French "Agence National de la Recherche", the Scientific Council of the University of Toulouse (Fr) and the Regional Council of Aquitaine (Fr) the French HCERES ("Haut Conseil de l'évaluation de la Recherche et de l'Enseignement Supérieur").

Conference Organisation: Participation in the organisation of 17 international conferences either as, organiser, treasurer, member of the scientific committee or member of the local committee.

Peer Reviewed Articles (2017 – 2021)

1 "Experimental and theoretical investigations of the kinetics and mechanism of the Cl + 4-hydroxy-4-methyl-2-pentanone reaction."
L. Aslan, A.M. Priya, C. Sleiman, M.N. Zeineddine, P. Coddeville, C. Fittschen, B. Ballesteros, A. Canosa, L. Senthilkumar, G. El Dib, and A. Tomas.
Atm. Env., **166**, 315-326 (2017).

2 "Is the Gas-phase OH+H_2CO Reaction a Source of HCO in Interstellar Cold Dark Clouds? A Kinetic, Dynamic and Modelling Study."
A.J. Ocaña, E. Jiménez, B. Ballesteros, A. Canosa, M. Antiñolo, J. Albaladejo, M. Agúndez, J. Cernicharo, A. Zanchet, P. Del Mazo, O. Roncero, and A. Aguado.
Astrophys. J., **850**[1], 28 (2017).

3 "Uniform Supersonic Chemical Reactors: 30 Years of Astrochemical History and Future Challenges."
A. Potapov, A. Canosa, E. Jiménez, and B.R. Rowe.
Angew. Chem. Int. Ed., **56**[30], 8618-8640 (2017).

4 "Gas Phase Kinetics of the OH + CH_3CH_2OH Reaction at Temperatures of the Interstellar Medium (T = 21 - 107 K)."
A.J. Ocaña, S. Blázquez, B. Ballesteros, A. Canosa, M. Antiñolo, J. Albaladejo, and E. Jiménez.
Phys. Chem. Chem. Phys., **20**[8], 5865-5873 (2018).

5 "Comment on "Methanol dimer formation drastically enhances hydrogen abstraction from methanol by OH at low temperature" by W. Siebrand, Z. Smedarchina, E. Martínez-Núñez and A. Fernández-Ramos, Phys. Chem. Chem. Phys., 2016, 18, 22712."
R.J. Shannon, J.C. Gómez-Martín, R.L. Caravan, M.A. Blitz, J.M.C. Plane, D.E. Heard, M. Antiñolo, M. Agúndez, E. Jiménez, B. Ballesteros, A. Canosa, G. El Dib, J. Albaladejo, and J. Cernicharo.
Phys. Chem. Chem. Phys., **20**[12], 8349-8354 (2018).

6 "Gas-Phase Reactivity of the CN radical with methyl amines at low temperatures (23 - 297 K): a combined experimental and theoretical investigation."
C. Sleiman, G. El Dib, D. Talbi, and A. Canosa.
ACS - Earth Spac. Chem., **2**[10], 1047-1057 (2018).

7 "Low temperature kinetics and theoretical studies of the reaction CN + CH_3 NH_2: a potential source of cyanamide and methyl cyanamide in the interstellar medium."
C. Sleiman, G. El Dib, M. Rosi, D. Skouteris, N. Balucani, and A. Canosa.
Phys. Chem. Chem. Phys., **20**[8], 5478-5489 (2018).

8 "Full Dimension Potential Energy Surface and Low Temperature Dynamics of the H_2CO + OH --> HCO + H_2O reaction."
A. Zanchet, P. Del-Mazo, A. Aguado, O. Roncero, E. Jiménez, A. Canosa, M. Agúndez, and J. Cernicharo.
Phys. Chem. Chem. Phys., **20**[8], 5415-5426 (2018).

9 "Experimental and theoretical investigation on the OH + $CH_3C(O)CH_3$ reaction at interstellar temperatures (T=11.7-64.4 K)."
S. Blázquez, D. González, A. García-Sáez, M. Antiñolo, A. Bergeat, F. Caralp, R. Mereau, A. Canosa, B. Ballesteros, J. Albaladejo, and E. Jiménez.
ACS - Earth Spac. Chem., **3**[9], 1873-1883 (2019).

10 "Gas phase reactivity of CH_3OH toward OH at interstellar temperatures (11.7 - 177.5 K): experimental and theoretical study."
A.J. Ocaña, S. Blázquez, A. Potapov, B. Ballesteros, A. Canosa, M. Antiñolo, L. Vereecken, J. Albaladejo, and E. Jiménez.
Phys. Chem. Chem. Phys., **21**[13], 6942-6957 (2019).

11 "Gas-phase kinetics of CH_3CHO with OH radicals between 11.7 and 177.5 K."
S. Blázquez, D. González, E.M. Neeman, B. Ballesteros, M. Agúndez, A. Canosa, J. Albaladejo, J. Cernicharo, and E. Jiménez.
Phys. Chem. Chem. Phys., **22**[36], 20562-20572 (2020).

12 "Kinetic measurements of Cl atom reactions with C_5-C_8 unsaturated alcohols."
A. Grira, C. Amarandei, M.N. Romanias, G. El Dib, A. Canosa, C. Arsene, J.G. Bejan, R.J. Olariu, P. Coddeville, and A. Tomas.
Atmosphere, **11**[3], 256 (2020).

13 "A New Instrument For Kinetics and Branching Ratio Studies of Gas Phase Collisional Processes at Very Low Temperatures."
O. Durif, M. Capron, J. Messinger, A. Benidar, L. Biennier, J. Bourgalais, A. Canosa, J. Courbe, G.A. Garcia, J.F. Gil, L. Nahon, M. Okumura, L. Rutkowski, I.R. Sims, J. Thievin, and S.D. Le Picard.
Rev. Sci. Instrum., **92**[1], 014102 (2021).

14 "Gas-phase ozonolysis of trans-2-hexenal: Kinetics, products, mechanism and SOA formation."
A. Grira, C. Kalalian, J.N. Illmann, L. Patroescu-Klotz, G. El Dib, P. Coddeville, A. Canosa, Coeur C., P. Wiesen, E. Roth, A. Chakir, and A. Tomas.
Atm. Env., **253**, 118344 (2021).

15 "An experimental study of the gas-phase reaction between Cl atoms and trans-2-pentenal: kinetics, products and SOA formation."
A. Grira, M. Antiñolo, A. Canosa, A. Tomas, E. Jiménez, and G. El Dib.
Chemosphere, **276**, 130193 (2021).

16 "The impact of water vapor on the OH reactivity towards CH3CHO at ultra-low temperatures (21.7-135.0 K): Experiments and Theory."
E.M. Neeman, D. González, S. Blázquez, B. Ballesteros, A. Canosa, M. Antiñolo, L. Vereecken, J. Albaladejo, and E. Jiménez.
J. Chem. Phys., (2021,accepté).

17 "Simple quantitative assessment of the outdoor versus indoor airborne transmission of viruses and covid-19."
B.R. Rowe, A. Canosa, J.M. Drouffe, and J.B.A. Mitchell.
Environ. Res., **198**, 111189 (2021).