

# GIANMARCO VANUZZO

— PhD —

## WORK EXPERIENCE

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### Post-doc position

September 2019 - September 2022

Department of Chemistry, Biology and Biotechnology  
University of studies of Perugia, Perugia, Italy

*Position of post-doc concerning the study of the dynamics of elementary reactions of oxygen and phenyl radicals with aromatic hydrocarbons relevant in combustion models of carbon nanoparticle formation.*

### High-School Teacher

September 2018 - June 2019

I.I.S. "Ettore Majorana"  
San Lazzaro di Savena, Bologna, Italy

*Full-Time teacher of Chemistry and S.T.A. (Scienze Tecnologie Applicate, Applied Technologies Sciences)*

### Specialty Pharmaceutical Representative

May 2017 - June 2019

Azienda Farmaceutica Italiana s.r.l.

*I take on the role of specialist in Azienda Farmaceutica Italiana s.r.l., with the task of informing medical professionals about innovative pharmaceutical products. Furthermore, the communicative aspect characterizing this work allowed me to fulfill the role of trainer for company employees.*

### Independent Consultant

January 2017 - April 2017

Department of Chemistry, Biology and Biotechnology  
University of studies of Perugia, Perugia, Italy

*Position of high qualified consultant concerning differential reactive cross-section measurements for chemical reactions between nitrogen in the excited electronic state  $^2D$  and aromatic hydrocarbons species (benzene and toluene) by crossed molecular beam technique and data analysis.*

### Tutor

October 2015 - February 2016

Department of Chemistry, Biology and Biotechnology  
University of studies of Perugia, Perugia, Italy

*Graduate teaching assistant in General and Inorganic Chemistry course*

## PERIOD ABROAD

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### Visiting PhD Student

April - July 2016

*Group COMEX with the supervision of Professor Astrid Bergéat  
Institut des Sciences Moléculaires  
University of Bordeaux / CNRS, Bordeaux, France*

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## CORE SKILLS

Ultra High Vacuum Systems

Crossed Molecular Beams Technique

Gas Phase Chemical and Physical  
Processes

Mass Spectrometric Technique

Lifelong Learning

Scientific Communication and Training

## Visiting PhD Student

March - April 2014

Group COMEX with the supervision of Dr. Kevin M. Hickson  
Institut des Sciences Moléculaires  
University of Bordeaux / CNRS, Bordeaux, France

## EDUCATION

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### Ph.D. in Physical Chemistry

January 2014 - April 2017

Department of Chemistry, Biology and Biotechnology  
University of studies of Perugia, Perugia, Italy

Thesis's title: *Dynamics studies of combustion relevant bimolecular reactions*

### Master's Degree in Chemistry (LM-54)

February 2010 - October 2012

Department of Molecular Science and Nanosystems  
University Ca' Foscari, Venice, Italy

Final mark: 110/110 ( cum laude)

Thesis's title: *Synthesis, characterization and reactivity of new vinyl complexes of Pd(II) with pyridal-carbenic-N-heterocyclic spectator ligands*

### Bachelor's Degree in Chemistry (D.M. 509/1999)

September 2006 - February 2010

Department of Molecular Science and Nanosystems  
University Ca' Foscari, Venice, Italy

Final mark: 110/110 ( cum laude)

Thesis's title: *Synthesis, characterization and reactivity of Pd(II) allene complexes containing diphenylphosphinocholine as ancillary ligands*

### High School Diploma in Chemistry

September 2001 - July 2006

IIS "Levi-Ponti" (ex ITIS "Primo Levi")  
Mirano (VE), Italy

Final mark: 100/100

## ADDITIONAL INFORMATIONS

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### SELECTION OF BEST CONFERENCES CONTRIBUTIONS

◻ Selected Oral contribution  
XXXIV Convegno delle Sezioni Toscana, Umbria, Marche e  
Abruzzo (TUMA)  
Perugia, Italy  
23 - 25 September 2015

"Crossed molecular beam studies of the  $O(^3P) + 1$ -butene reaction"  
G. Vanuzzo *et al.* (Book of Abstract, CO12)

# GIANMARCO VANUZZO

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## DIGITAL SKILLS

Windows OS

VERY GOOD

Microsoft Office

VERY GOOD

Origin

EXCELLENT

Chem Office

VERY GOOD

## LANGUAGES

ENGLISH

Reading: B2

Speaking: B1

Listening: B1

Writing: B1

## ADDITIONAL INFORMATIONS

### SELECTION OF BEST CONFERENCES CONTRIBUTIONS

Selected Poster contribution

XXVI International Symposium on molecular beams  
Segovia, Spain  
28 June - 3 July 2015

*"Crossed molecular beam studied of the  $O(^3P) + Propene$  and  $O(^3P) + Propyne$  reactions"*

G. Vanuzzo *et al.* (Book of Abstract, p. 104)

Selected Oral and Poster contribution

Annual meeting of WG1/WG4 COST Action: Our astrochemical history  
Pisa, Italy  
7 - 8 March 2016

*"The reaction of atomic oxygen with propene and its possible role in controlling interstellar propene abundance"*

G. Vanuzzo *et al.* (Book of Abstract, p. 35)

Selected Oral and Poster contribution

*Poster Prize Winner*

24th International Symposium on gas kinetics and related phenomena  
York, England  
17 - 21 July 2016

*"Crossed molecular beam studies of the  $O(^3P) + 1$ -butene reaction: primary products, branching ratios and role of intersystem crossing "*

G. Vanuzzo *et al.* (Book of Abstract, RD 05)

Selected Oral and Poster contribution

XLIV Congresso della divisione di Chimica-Fisica della Società di Chimica Italiana  
Napoli, Italy  
20 - 23 September 2016

*"Reaction dynamics of  $O(^3P) + propyne$ : primary products, branching ratios and role of intersystem crossing from molecular beams experiments and Ab Initio and statistical calculations "*

G. Vanuzzo *et al.*

Selected Oral contribution

XXIX International Symposium on Molecular Beams  
Virtual (online)  
1 - 2 July 2021

*"Crossed-Beams and Theoretical Studies of the  $O(^3P, ^1D) + Benzene$  Reactions: Primary Products, Branching Fractions, and Role of Intersystem Crossing"*

G. Vanuzzo *et al.*

Selected Oral contribution

AGU Fall Meeting 2021  
New Orleans, LA & Virtual (online)  
13 - 17 December 2021

*"Crossed-beams and theoretical studies of the Titan relevant  $N(^2D) + Benzene$  reaction: Primary products and branching fractions"*

G. Vanuzzo *et al.*

Selected Oral contribution

Chianti Topics: 5th International Focus Group  
Firenze, Italy  
20 - 22 April 2022

*A laboratory investigation of the reaction  $N(^2D) + benzene$  and implications for the atmospheric chemistry of Tita"*

G. Vanuzzo *et al.*

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## ADDITIONAL INFORMATIONS

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### PUBLICATIONS

- ⬡ C. Cavallotti, F. Leonori, N. Balucani, V. Nevrlly, A. Bergeat, S. Falcinelli, G. Vanuzzo, and P. Casavecchia  
*" Relevance of the Channel Leading to Formaldehyde + Triplet Ethylidene in the  $O(^3P) + Propene$  Reaction under Combustion Conditions "*  
*J. Phys. Lett.* 5, 4213-4218 (2014)
- ⬡ F. Leonori, N. Balucani, V. Nevrlly, A. Bergeat, S. Falcinelli, G. Vanuzzo, P. Casavecchia, and C. Cavallotti  
*" Experimental and Theoretical Studies on the Dynamics of the  $O(^3P) + Propene$  Reaction: Primary Products, Branching Ratios and Role of Intersystem Crossing "*  
*J. Phys. Chem. C* 119, 14632-14652 (2015)
- ⬡ J. W. Stubbing, G. Vanuzzo, A. Moudens, J.C. Loison, and K.M. Hickson  
*" Gas-Phase kinetics of the  $N + C_2N$  reaction at low temperature "*  
*J. Phys. Chem. A* 119, 3194-3199 (2015)
- ⬡ G. Vanuzzo, F. Leonori, D. Stranges, S. Falcinelli, V. Nevrlly, N. Balucani, P. Casavecchia, I. Gismondi, and C. Cavallotti  
*" Isomer-Specific Chemistry in the Propyne and Allene Reactions with Oxygen Atoms:  $CH_3CH + CO$  versus  $CH_2CH_2 + CO$  Products "*  
*J. Phys. Chem. Letters* 7, 1010-1015 (2016)
- ⬡ G. Vanuzzo, N. Balucani, F. Leonori, D. Stranges, S. Falcinelli, V. Nevrlly, A. Bergeat, P. Casavecchia, and C. Cavallotti  
*" Reaction Dynamics of  $O(^3P) + Propyne$ : I. Primary Products, Branching Ratios, and Role of Intersystem Crossing from Crossed Molecular Beam Experiments "*  
*J. Chem. Phys. A* 120, 4603-4618 (2016)
- ⬡ I. Gismondi, C. Cavallotti, G. Vanuzzo, N. Balucani, and P. Casavecchia  
*" Reaction Dynamics of  $O(^3P) + Propyne$ : II. Primary Products, Branching Ratios, and Role of Intersystem Crossing from Ab Initio Coupled Triplet/singlet Potential Energy Surfaces and Statistical Calculations"*  
*J. Chem. Phys. A* 120, 4619-4633 (2016)
- ⬡ A. Caracciolo, G. Vanuzzo, N. Balucani, D. Stranges, C. Cavallotti, P. Casavecchia  
*" Observation of H displacement and  $H_2$  elimination channels in the reaction of  $O(^3P)$  with 1-butene from crossed beams and theoretical studies"*  
*Chem. Phys. Lett.* 683, 105-111 (2017)
- ⬡ A. Caracciolo, D. Lu, N. Balucani, G. Vanuzzo, D. Stranges, X. Wang, J. Li, H. Guo, and P. Casavecchia  
*" A Combined Experimental-Theoretical Study of  $OH + CO \rightarrow H + CO_2$  Reaction Dynamics "*  
*J. Phys. Chem. Lett.* 9, 6, 1229-1236 (2018)
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### PUBLICATIONS

- ⬡ J. Klos, A. Bergeat, G. Vanuzzo, S. B. Morales, C. Naulin, F. Lique  
*" Probing Nonadiabatic Effects in Low-Energy  $C(^3P_j) + H_2$  Collisions"*  
*J. Phys. Chem. Lett.* 9, 22, 6496-6501 (2018)
- ⬡ A. Caracciolo, G. Vanuzzo, N. Balucani, D. Stranges, S. Tanteri, C. Cavallotti, P. Casavecchia  
*" Crossed molecular beams and theoretical studies of the  $O(^3P) + 1, 2$ -butadiene reaction: Dominant formation of propene+ CO and ethylidene+ ketene molecular channels"*  
*Chin. J. Chem. Phys.* 32, 1, 113 (2019)
- ⬡ A. Caracciolo, G. Vanuzzo, P. Recio, N. Balucani, P. Casavecchia  
*"Molecular beam studies of elementary reactions relevant in plasma/ combustion chemistry:  $O(^3P) +$ unsaturated hydrocarbons"*  
*Rend. Fis. Acc. Lincei* (2019)
- ⬡ A. Caracciolo, G. Vanuzzo, N. Balucani, D. Stranges, P. Casavecchia, L. Pratali Maffei, C. Cavallotti  
*"Combined Experimental and Theoretical Studies of the  $O(^3P) + 1$ -Butene Reaction Dynamics: Primary Products, Branching Fractions, and Role of Intersystem Crossing"*  
*J. Phys. Chem. A* 123, 46, 9934-9956 (2020)
- ⬡ C. Cavallotti, C. De Falco, L. Pratali Maffei, A. Caracciolo, G. Vanuzzo, N. Balucani, P. Casavecchia  
*"Theoretical Study of the Extent of Intersystem Crossing in the  $O(^3P) + C_6H_6$  Reaction with Experimental Validation"*  
*J. Phys. Chem. Lett.* 22, 11, 9621-9628 (2020)
- ⬡ M. Rosi, S. Falcinelli, P. Casavecchia, N. Balucani, P. Recio, A. Caracciolo, G. Vanuzzo, D. Skouteris, C. Cavallotti  
*"A Computational Study on the Attack of Nitrogen and Oxygen Atoms to Toluene"*  
*ICCSA 2021. Lecture Notes in Computer Science()*, vol 12953 (2021)
- ⬡ G. Vanuzzo, A. Caracciolo, T. K. Minton, N. Balucani, P. Casavecchia, C. de Falco, A. Baggioli, C. Cavallotti  
*"Crossed-Beam and Theoretical Studies of the  $O(^3P, ^1D) +$  Benzene Reactions: Primary Products, Branching Fractions, and Role of Intersystem Crossing"*  
*J. Phys. Chem. A* 38, 125, 8434-8453 (2021)
- ⬡ L. Mancini, G. Vanuzzo, D. Marchione, G. Pannacci, P. Liang, P. Recio, M. Rosi, D. Skouteris, P. Casavecchia, N. Balucani  
*"The Reaction  $N(^2D) + CH_3CCH$  (Methylacetylene): A Combined Crossed Molecular Beams and Theoretical Investigation and Implications for the Atmosphere of Titan"*  
*J. Phys. Chem. A* 38, 125, 8434-8453 (2021)
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## ADDITIONAL INFORMATIONS

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### PUBLICATIONS

◻ P. Liang, L. Mancini, D. Marchione, G. Vanuzzo, F. Ferlin, P. Recio, Y. Tan, G. Pannacci, L. Vaccaro, M. Rosi, P. Casavecchia, N. Balucani

"Combined crossed molecular beams and theoretical study on the  $N(^2D)+HCCN$  ( $X^1\Sigma^+$ ) reaction and implications for extra-terrestrial environments"  
*Mol. Phys.* 1-2, 120, e1948126 (2022)

◻ D. Marchione, L. Mancini, P. Liang, G. Vanuzzo, F. Pirani, D. Skouteris, M. Rosi, P. Casavecchia, N. Balucani

"Unsaturated Dinitriles Formation Routes in Extraterrestrial Environments: A Combined Experimental and Theoretical Investigation of the Reaction between Cyano Radicals and Cyanoethene ( $C_2H_3CN$ )"  
*J. Phys. Chem. A* 126, 22, 3569-3582 (2022)

◻ G. Vanuzzo, A. Giustini, M. Rosi, P. Casavecchia, N. Balucani

"Theoretical Study of the Reaction  $O(P)+1,2$ -Butadiene"  
*ICCSA 2022 Workshops. ICCSA 2022. Lecture Notes in Computer Science, vol. 13382. Springer, Cham. (2022)*

◻ L. Mancini, E.V.F. de Aragão, G. Vanuzzo

"A Theoretical Investigation of the Reactions of  $N(D)$  and  $CN$  with Acrylonitrile and Implications for the Prebiotic Chemistry of Titan"  
*ICCSA 2022 Workshops. ICCSA 2022. Lecture Notes in Computer Science, vol. 13378. Springer, Cham. (2022)*

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