Vianney Taquet
Curriculum Vitae

Osservatorio Astrofisico di Arcetri
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Employment

- Since 05/2017 — **Astro FIt 2 Research Fellow**, *Arcetri Observatory, Italy*
  PI of research programme entitled *PROSPECTS: PRebiotic mOlecules from SPace to ComeTS*
- 01/2015 – 04/2017 — **Postdoctoral Research Associate**, *Leiden Observatory, The Netherlands*
- 02/2013 – 12/2014 — **NASA Postdoctoral Program Research Fellow**, *NASA Goddard Space Flight Center, Greenbelt, Maryland, USA*
  PI of research programme entitled *Deuterium fractionation of interstellar organic molecules: a clue for the origin of meteoritic amino-acids*
- 10/2012 – 12/2012 — **Postdoctoral Research Fellow**, *Institut de Planétologie et d'Astrophysique de Grenoble (IPAG), France*
- 09/2009 – 09/2012 — **PhD student**, *Institut de Planétologie et d'Astrophysique de Grenoble, France*
  Thesis title: *Grain surface chemistry in low-mass star-forming regions.*
  Advisors: Cecilia Ceccarelli and Claudine Kahane (IPAG)
- 04/2009 – 07/2009 — **MSc Internship**, *Laboratoire d'Etudes du Rayonnement et de la Matière (LERMA), Paris, France*
  Thesis title: *Molecular Signatures of Protostellar Jets*
  Advisors: Sylvie Cabrit (LERMA) and Guillaume Pineau-des-Forets (IAS)
- 04/2008 – 07/2008 — **MSc Internship**, *Center of Astrophysics and Supercomputing, Swinburne University, Melbourne, Australia*
  Thesis title: *Physical Chemistry of Protoplanetary Dust Formation*
  Advisors: Sarah Maddison and Geoff Brooks (Swinburne University)
- 05/2007 – 08/2007 — **BSc Internship**, *Laboratoire d'Etudes Spatiales et d'Instrumentation en Astrophysique (LESIA), Meudon, France*
  Thesis title: *Relationships between the Magnetic Field of the Sun and its Flares*
  Advisors: Nicole Vilmer and Véronique Bommier (LESIA)

Education

- 2009 – 2012 — **PhD in Astrophysics**, Institut de Planétologie et d'Astrophysique de Grenoble (IPAG), Université de Grenoble, France.
- 2008 - 2009 — **Second year of Master's degree in Fundamental Physics: Astronomy and Astrophysics**, Observatoire de Paris, France, *honors.*
- 2007 - 2008 — **First year of Master's degree in Fundamental Physics**, Université Paris-Sud, Orsay, France, *honors.*
- 2006 – 2007 — **Licence's degree in Fundamental Physics**, Université Paris-Sud, Orsay, France, *honors.*
- 2004 – 2006 — ***Classes Préparatoires aux Grandes Ecoles d'Ingénieur*, Option: Physics & Chemistry**, Lycée Faidherbe, Lille, France.
- 2004 — **Scientific Baccalaureate**, Lycée Faidherbe, Lille, France, *honors.*

Technical Skills

- **Astrophysics** Gas-grain astrochemical modelling, sub-mm (single-dish and interferometric) observations, dynamics of low-mass star formation
- **Chemistry** Physical and chemical processes of heterogeneous ices, chemical networks, modelling of ice analogs
- **Programming** Fortran, C, Python, basics in shell
- **Softwares** IDL, GILDAS, LaTeX, Office, Open Office, Adobe suite, Gnuplot, Gimp

Awards and Professional Activities

- **Awards**

12/2016 Astro FIt 2 fellowship
09/2012 NASA Postdoctoral Program fellowship
01/2012 Best press release article awarded at the "SASP 2012" conference

- **Referee for scientific journals**

2013 - present Referee of 11 manuscripts submitted to *Astronomy and Astrophysics*, *The Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*, and *Molecular Astrophysics*

- **Teaching and Student Mentoring**

09/2016 - 08/2017 Main supervisor of the MSc student, Neilufar Khorshid, for her research project entitled *Chemical signatures of episodic accretion in embedded protostars*
06/2016 - 08/2016 Main supervisor of the LEAPS student, Umut Kavak, for his 3-month research project entitled *Chemical complexity in protostellar outflows*
2015 - 2016 Coordinator of the LEAPS (Leiden/ESA Astrophysics Programme for Summer Students) 2016 Program
09/2015 - 08/2016 Co-supervisor of the MSc student, Andrew Barr, for his research project entitled *ALMA observations of complex organics in the high-mass protostar AFGL 4176*
06/2015 - 08/2015 Main supervisor of the LEAPS student, Kerry Ballantine, for her 3-month research project entitled *Understanding the formation of complex organics in star-forming regions*
2010 - 2011 Introductory programming with Maple : 1st year university level, 30 hours.
2009 - 2012 Seminars of Molecular Astrophysics to College and Master classes.

- **PhD Committees**

2016 “Opposition Committee" for Dr. M. Drozdovskaya (Leiden Observatory)
Thesis title: “Inextricable ties between chemical complexity and dynamics of embedded protostellar regions"

- **Conference and Seminar Organisation**

2016 Scientific co-organiser of the EWASS2016 Symposium "Interstellar dust and gas coupling"
2015 - present Organiser of the Astrochem Seminars of the Leiden Observatory
2010 Webmaster for the "COST Action Annual" conference
2011 Webmaster for the "SASP 2012" conference

Complementary Information

- **Languages** French (mother tongue), English (fluent), Spanish (scholar level), Italian (beginner)
- **Leisure activities** Running, mountain-biking, skiing, soccer, cinema, traveling

First-author publications

[9] **V. Taquet**, E. Wirström, S. B. Charnley, A. Faure, A. López-Sepulcre, C. Persson 2017, *Chemical complexity induced by efficient evaporation in the Barnard 5 Molecular Cloud*, A&A, 607, A20 [URL]
[8] **V. Taquet**, K. Furuya, C. Walsh, E. F. van Dishoeck 2016, *A primordial origin for molecular oxygen in comets: A chemical kinetics study of the formation and survival of O_2 ice from clouds to disks*, MNRAS, 462, 99 [URL]
[7] **V. Taquet**, E. Wirstrom, S. B. Charnley 2016, *Formation and recondensation of complex organic molecules during protostellar luminosity outbursts*, ApJ, 821, 46 [URL]
[6] **V. Taquet**, A. Lopez-Sepulcre, C. Ceccarelli, R. Neri, C. Kahane, S. B. Charnley 2015, *Constraining the abundances of complex organics in the inner regions of solar-type protostars*, ApJ, 804, 81 [URL]
[5] **V. Taquet**, S. B. Charnley, O. Sipilä 2014, *Multilayer Formation and Evaporation of Deuterated Ices in Prestellar and Protostellar Cores*, ApJ, 791, 1 [URL]
[4] **V. Taquet**, A. Lopez-Sepulcre, C. Ceccarelli, R. Neri, C. Kahane, A. Coutens, C. Vastel 2013, *Water deuterium fractionation in the inner regions of two low-mass protostars*, ApJL, 768, L29 [URL]
[3] **V. Taquet**, P. Peters, C. Kahane, C. Ceccarelli, D. Duflot, C. Toubin, A. Faure, L. Wiesenfeld 2013, *Modelling of deuterated water ice formation*, A&A, 550, A127 [URL]
[2] **V. Taquet**, C. Ceccarelli, C. Kahane 2012, *Formaldehyde and methanol deuteration in protostars: fossiles from a past fast high density pre-collapse phase*, ApJL, 748, L3 [URL]
[1] **V. Taquet,** C. Ceccarelli, C. Kahane 2012, *Multilayer modeling of grain porous surface chemistry I. The GRAINOBLE code*, A&A, 538, 42 [URL]

Second- and third-author publications

[8] O. Sipilä, P. Caselli, **V. Taquet** 2016, *Effect of multilayer ice chemistry on gas-phase deuteration in starless cores*, A&A, 591, 9 [URL]
[7] D. Quenard, **V. Taquet**, C. Vastel, P. Caselli, C. Ceccarelli 2015, *Detectability of deuterated water in prestellar cores* 2016, A&A, 585, A36 [URL]
[6] N. Balucani, C. Ceccarelli, **V. Taquet** 2015, *New routes of gas-phase formation of complex organic molecules in cold gas*, MNRAS, 449, L16 [URL]
[5] A. Rimola, **V. Taquet**, P. Ugliengo, N. Balucani, C. Ceccarelli, 2014, *A combined quantum chemical and modelling study of CO hydrogenation on water ice*, A&A 572, A70 [URL]
[4] A. López-Sepulcre, **V. Taquet**, A. Sánchez-Monge, C. Ceccarelli, C. Dominik, F. Fontani, P.T.P. Ho, C. Kahane, M. Kama, R. Neri 2013, *High angular resolution observations towards OMC-2 FIR 4: Dissecting an intermediate-mass protocluster*, A&A, 556, A62 [URL]
[3] A. Bacmann, **V. Taquet**, A. Faure, C. Kahane, C. Ceccarelli 2012, *Detection of complex organic molecules in a prestellar core: a new challenge for astrochemical models*, A&A, 541, L12 [URL]
[2] A. Ratajczak, **V. Taquet**, C. Kahane, C. Ceccarelli, A. Faure, E. Quirico 2011, *The puzzling deuteration of methanol in low- to high- mass protostars*, A&A, 528, 13 [URL]
[1] F. Pignatale, S. Maddison, **V. Taquet**, G. Brooks, K. Liffman 2011, *The effect of the regular solution model in the condensation of protoplanetary dust*, MNRAS, 506 [URL]

Other publications

[10] M. V. Persson, J. K. Jørgensen, H. S. P. Müller, A. Coutens, E. F. van Dishoeck, V. Taquet, H. Calcutt, M. H. D. van der Wiel, T. L. Bourke, S. Wampfler 2018, *The ALMA-PILS survey: Formaldehyde deuteration in warm gas on small scales toward IRAS 16293-2422 B*, Accepted for publication in A&A [URL]
[9] E. Bianchi, C. Codella, C. Ceccarelli, **V. Taquet** et al. 2017, *Deuterated methanol on Solar System scale around the HH212 protostar*, A&A, 606, L7 [URL]
[8] E. Bianchi, C. Codella, C. Ceccarelli, F. Fontani, L. Testi, B. Lefloch, L. Podio, **V. Taquet** 2017, *Decrease of the organic deuteration during the evolution of Sun-like protostars: the case of SVS13-A*, MNRAS, 467, 3011 [URL]
[7] K. Furuya, M. N. Drozdovskaya, R. Visser, E. F. van Dishoeck, C. Walsh, D. Harsono, U. Hincelin, V. Taquet 2017, *Water delivery from cores to disks: Deuteration as a probe of the prestellar inheritance of H2O*, A&A, 599, A40 [URL]
[6] C. Codella, C. Ceccarelli, E. Bianchi, L. Podio, R. Bachiller, B. Lefloch, F. Fontani, **V. Taquet**, L. Testi

2016, *Hot and dense water in the inner 25 au of SVS13-A*, MNRAS, 462, L75 [URL]
[5] A. Coutens, J. Jørgensen, M. Persson, E. van Dishoeck, C. Vastel, **V. Taquet** 2014, *High D_2O/HDO ratio in the inner regions of the low-mass protostar NGC1333 IRAS2A*, A&A, 792, L5 [URL]
[4] N. Sakai, T. Sakai, T. Hirota, Y. Watanabe, C. Ceccarelli, C. Kahane, S. Bottinelli, E. Caux, K. Demyk, C. Vastel, A. Coutens, **V. Taquet**, N. Ohashi, S. Takakuwa, Y. Shigehisa, H-W. Yen, Y. Aikawa, S. Yamamoto 2013, *Change in the chemical composition of infalling gas forming a disk around a protostar*, Nature, 507, 7490 [URL]
[3] A. Coutens, C. Vastel, S. Cabrit, C. Codella, L. E. Kristensen, C. Ceccarelli, E. van Dishoeck, A. C. A. Boogert, S. Bottinelli, A. Castets, E. Caux, C. Comito, K. Demyk, F. Herpin, B. Lefloch, C. McCoey, J. C. Mottram, B. Parise, **V. Taquet**, F. F. S. van der Tak, R. Visser, U. A. Yildiz 2013, *Deuterated water in the solar-type protostars NGC 1333 IRAS 4A and IRAS 4B*, A&A, 560, A39 [URL]
[2] A. Coutens, C. Vastel, S. Cazaux, S. Bottinelli, E. Caux, C. Ceccarelli, K. Demyk, **V. Taquet**, V. Wakelam 2013, *Heavy water stratification in a low-mass protostar*, A&A, 553, A75 [URL]
[1] C. Codella, C. Ceccarelli, B. Lefloch, F. Fontani, G. Busquet, P. Caselli, C. Kahane, **V. Taquet**, M. Vasta, S. Viti, L. Wiesenfeld 2012, *Fossile deuteration in the protostellar shock L1157-B1*, ApJL, 757, L9 [URL]

Upcoming publications

Submitted
[4] A. Rimola, D. Skouteris, N. Balucani, C. Ceccarelli, **V. Taquet**, P. Ugliengo 2018, *Can formamide be formed on interstellar ice? An atomistic perspective*, submitted to A&A
[3] C. Ceccarelli, S. Viti, N. Balucani, **V. Taquet** 2018, *The evolution of grain mantles and dust growth at high redshift*, submitted to MNRAS
[2] M. L. R. van 't Hoff, M. V. Persson, D. Harsono, **V. Taquet**, J. K. Jørgensen, R. Visser, E. A. Bergin, E. F. van Dishoeck 2018, *Imaging the water snowline in a protostellar envelope with $H^{13}CO^+$*, submitted to A&A
[1] J. K. Jørgensen, H. S. P. Müller, H. Calcutt, A. Coutens, M. N. Drozdovskaya, K. I. Oberg, M. V. Persson, **V. Taquet**, E. F. van Dishoeck, S. F. Wampfler 2018, *The ALMA-PILS survey: Isotopic composition of oxygen-containing complex organic molecules toward IRAS 16293-2422B*, submitted to A&A

In preparation
[3] **V. Taquet**, M. V. Persson, C. Codella, C. Ceccarelli, E. Bianchi 2018, *Warm deuterated methanol observations around two low-mass protostars: evidence for a precursor dark cloud temperature regulated temperature of methanol deuteration*
[2] E. Bøgelund, M. Hogerheijde, N. Ligterink, **V. Taquet**, M. Hogerheijde, E. F. van Dishoeck 2018, *Low levels of methanol deuteration in the high-mass star-forming region NGC 6334I*
[1] **V. Taquet**, E. F. van Dishoeck, J. K. Jørgensen, D. Harsono et al. 2017, *Linking interstellar and cometary O_2: a deep search for $O^{18}O$ in the solar-type protostar IRAS16293-2422*

Invited talks

- 12/2017 — *Non-thermal desorption processes in dark clouds*, "Gas phase cold chemistry of COMs: a challenge for experiments, theory, and astrophysical modelling" (Ciudad Real, Spain)
- 09/2017 — *Tracing the chemical evolution of organic molecules from dark clouds to planetary systems*, "LXI Congresso della Società Astronomica Italiana" (Padova, Italy)
- 06/2017 — *Astrochemical models for the formation of complex organic molecules in star-forming regions*, "Physical-chemical processes of astrophysical interest" (Saint-Florent, France)
- 01/2017 — *Bulk processes in interstellar ices*, "The Astrochemical Week" (Faro, Portugal)
- 10/2016 — *Theoretical fractionation in Young Stellar Objects*, "Fractionation of isotopologues in space" (Arcetri, Italy)
- 10/2016 — *Astrochemical models in the JWST Era*, "The Ice Age" Lorentz Workshop (Leiden, The Netherlands)
- 08/2014 — *Multiphase astrochemical models*, "Grain Surface Networks and Data for Astrochemistry" (Lorentz Center, Leiden, The Netherlands)
- 10/2012 — *Ice deuteration: models and observations to interpret the protostar history*, "Workshop on Interstellar Matter 2012" (Sapporo, Japan)

Contributed talks

- 03/2017 — *A primordial origin for O_2 in comets*, "IAU Symposium 332" (Puerto Varas, Chile) [URL]
- 11/2016 — *A primordial origin for O_2 in comets*, "ECLA 2016" (Madrid, Spain)
- 10/2016 — *A primordial origin for O_2 in comets*, "Astrolille PCMI 2016" (Lille, France)
- 04/2016 — *A primordial origin for O_2 in comets*, "Water in the Universe" (ESTEC, Noordwijk, The Netherlands)
- 10/2015 — *Formation and recondensation of complex organics during luminosity outbursts*, "From clouds to protoplanetary disks: the astrochemical link" (Berlin, Germany)
- 05/2015 — *Formation and recondensation of complex organics during luminosity outbursts*, "KIDA 2015 Workshop" (CNES, Paris, France)
- 04/2013 — *Ice deuteration: models and observations to interpret the protostar history*, "From Stars to Life 2013" (Gainesville, FL, USA)
- 11/2012 — *Ice deuteration: models and observations to interpret the protostar history*, "Physique et Chimie du Milieu Interstellaire" (Paris, France)
- 10/2012 — *Ice deuteration: models and observations to interpret the protostar history*, "COST Action Annual Conference 2012" (Catania, Italy)
- 07/2012 — *The GRAINOBLE model interpretation of deuterated water observed by Herschel*, "EWASS 2012: The astrochemical universe unveiled with Herschel" (Rome, Italy)

Seminars

- 10/2017 *Futur seminar*, Paris-Cergy University (Cergy-Pontoise, France)
- 09/2017 *Futur seminar*, University of Bern (Switzerland)
- 02/2016 *Chemical complexity in star-forming regions: towards a new paradigm?*, IPAG (Grenoble, France)
- 01/2016 *Chemical complexity in star-forming regions: towards a new paradigm?*, Arcetri Observatory (Italy)
- 02/2015 *Chemical complexity at the early stages of star formation*, Astrochem seminar series (Leiden Observatory, The Netherlands)
- 02/2015 *Chemical complexity at the early stages of star formation*, The University of Tokyo (Japan)
- 10/2014 *Interferometric observations and astrochemical modelling of complex organics around low-mass protostars*, IR/submm/mm Sack Lunch Series (Caltech, Pasadena, USA)
- 12/2013 *Chemical evolution at the early stages of low-mass star formation: deuteration and chemical complexity*, UVa / NRAO Astronomy (TUNA) Lunch Talks (Charlottesville)
- 11/2013 *Water and organics around low-mass protostars: deuteration and chemical complexity*, Department of Astronomy, The University of Maryland
- 04/2013 *Ice deuteration: models and observations to interpret the protostar history*, Solar System Exploration Seminar, NASA Goddard Space Flight Center

Accepted observational proposals

- 08/2016 - ALMA *Linking interstellar and cometary O_2: A deep search for $^{16}O^{18}O$ in a Solar System precursor* (A rated)
- 03/2015 - IRAM 30m *Origin of the efficient non-thermal evaporation of methanol in the Barnard 5 molecular cloud* (B rated)
- 03/2015 - IRAM 30m *Chemical signatures of episodic luminosity outbursts in embedded protostars* (A rated)
- 09/2014 - IRAM 30m *Deuteration and chemical complexity induced by efficient ice evaporation in Barnard 5* (B rated)
- 07/2014 - NRO 45m *Deuteration and chemical complexity induced by efficient ice evaporation in Barnard 5*
- 04/2014 - APEX *Probing the molecular content of southern FUor sources*
- 03/2014 - IRAM 30m *Spatial distribution and physical properties of a low-mass protostellar outflow* (B rated)
- 03/2010 - IRAM PdBi *Methyl formate and methanol: two key complex organic molecules* (B rated)