

# Maximilien Franco



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## RESEARCH INTEREST

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Galaxy formation and evolution • Multi-wavelength astronomy • Optically-dark galaxies • High-redshift galaxies • Dust properties  
• Size evolution • ISM • Star-formation history • Quenching • (Near)-Infrared spectroscopy • ALMA • JWST • Euclid

## EDUCATION

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- PhD in Astronomy and Astrophysics Paris University/ CEA-Saclay, France, 2016 – 2019
- Master's degree in Astronomy and Astrophysics Paris Observatory, France, 2014 – 2016
- Master's degree in Territorial systems, sustainable development and decision support ENS Lyon, France, 2010 – 2011
- Generalist Engineer – Management of Risks and Environment Ecole des Mines d'Alès, France, 2006 – 2011

## PROFESSIONAL EXPERIENCE

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- Postdoctoral fellowship in Astrophysics University of Hertfordshire, UK 2019 - Present  
Supervised by Prof. Kristen Coppin, this postdoc seeks to unveil the mysteries of one of the most luminous galaxies in the young Universe and to understand their evolution from a chemical and dynamical point of view with ALMA
- PhD in Astronomy and Astrophysics Paris University/CEA-Saclay, France, 2016 - 2019  
Supervised by Dr. David Elbaz, the goal of this PhD was to trace back the cosmic history of galaxy formation with ALMA. Led an international collaboration on the exploitation of the largest extragalactic survey with ALMA.
- Scientific outreach Various places, France, 2009 - 2019  
Scientific outreach programs including full-time at the *Musée des Arts et Métiers* (Paris, France) for one year, periodically teaching theory and practical workshops for the French Astronomy Organisation for 10 years, and presenting planetarium shows at the Air and Space Museum (Le Bourget, France) for 3 years. I also served as a scientific educator for the association *Les Petits Débrouillards* for 8 years, for *Planete Sciences* and with *Universcience*.
- Research engineer Réunion Island, France, 2011  
Study of the energy performance of a positive energy building. Publication of a research paper for the Architectural Science Association (ANZASCA) conference "Environmental design and performance of the ENERPOS building, Reunion Island".

## SKILLS

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- Computing: Python (expert) – Fortran, IDL, C/C++, Bash (basic).
- Astronomical Software: CASA, Gildas, CIGALE, Lephare, Eazy, Fast, SExtractor, Galfit, Visilens, Topcat, Blobcat, PyBDSF, ds9

## TEACHING, SUPERVISION AND SERVICE

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- Co-supervisor of a PhD student, T. Garratt University of Hertfordshire, UK, 2019 - Present
- General Physics for Medical Students 1st year, University of Paris, France, 2019
- Computer and internet tools 1st year, University of Paris, France, 2018
- Life and Microgravity Various places, France, 2017
- Journal Referee A&A, MNRAS
- Seminar organiser University of Hertfordshire

## TELESCOPE TIME AND OBSERVATIONS

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- Accepted programs
- PI: ALMA 10h, follow-up of 6 identified HST-dark sources, #2018.1.01079.S
  - Co-I: ALMA: #2021.1.01650.S, #2019.1.01642.S, #2019.1.01285.S, #2018.1.01807.S, #2017.1.00755.S; IRAM: #W17EV
- On-site Observations
- VLT 6 nights, VIMOS, VANDELS survey, PI: L. Pentericci
  - IRAM-30m 2 days, EMIR, kinematics and composition of proto-stellar clouds, PI: A. Maury

## ORAL (INVITED) CONTRIBUTIONS

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- Conference: National Astronomy Meeting 2021, Bath, UK (Virtual) (Jul. 2021)
- **Talk: Friday Astronomy Lunch Talk, Durham, UK (Virtual) (June 2021)**
- Conference: European Astronomical Society Annual Meeting - EAS 2021, Leiden, The Netherlands (Virtual) (June 2021)
- Conference: Chemical Abundances in Gaseous Nebulae, Universidade do Vale do Paraíba, Brazil (Virtual) (May 2021)
- Conference: Galaxy Evolution and Feedback Across Different Environments, Bento Gonçalves, Brazil (Mar. 2020)
- **Conference: The growth of galaxies in the Early Universe - VI, Sesto, Italy (Jan. 2020)**
- Conference: AGN-Starburst Meeting, Guiyang, China (Aug. 2019)
- Conference: Observing the millimeter Universe with the NIKA2 camera, Grenoble, France (Jun. 2019)
- **Conference: The growth of galaxies in the Early Universe - V, Sesto, Italy (Jan. 2019)**
- Conference: Programme National Cosmologie et Galaxies, Paris, France (Nov. 2018)
- Conference: The Universe by the Light of CANDELS: Past and Future, University UMass, MA, USA (Oct. 2018)
- Conference: Birth, life and fate of massive galaxies and their central beating heart, Favignana, Italy (Sept. 2018)
- Conference: The growth of galaxies in the Early Universe - IV, Sesto, Italy (Jan. 2018)
- Conference: Programme National Cosmologie et Galaxies, Lyon, France (Nov. 2017)
- Conference: Challenges in Galaxy Evolution: from black holes to the cosmic web, Florence, Italy (Aug. 2017)

## SELECTED WORKSHOPS

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- International Summer School on the ISM of Galaxies, from the Epoch of Reionization to the Milky Way (Virtual) (Jul. 2021)
- Virtual 17th Synthesis Imaging Workshop (Virtual) (Jul. 2020)
- The next generation extragalactic millimeter surveys: A planning workshop for public legacy surveys with TolTEC/LMT, University UMass, MA, USA (Oct. 2018)
- ESAC Data Analysis & Statistics, Madrid, Spain (Nov. 2017)
- 2nd ASTERICS Virtual Observatory School, Strasbourg, France (Nov. 2016)
- Physical Characteristics of Normal Galaxies at  $z > 2$ , Leiden, The Netherlands (Oct. 2016)

## REFEREED PUBLICATIONS

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The ADS list of refereed and non-refereed publications can be find [here](#). H-index: 11, 605 citations

### First author - 125 citations

- **Franco, M.**; Coppin, K. E. K.; Geach, J. E.; Kobayashi, C.; Chapman, S. C.; Yang, C.; González- Alfonso, E.; Spilker, J. S.; Cooray, A.; Michałowski, M. J., “*The ramp-up of interstellar medium enrichment at  $z > 4$* ”, accepted for publication, **Nature Astronomy (2021)**
- **Franco, M.**; Elbaz, D.; Zhou, L.; Magnelli, B.; Schreiber, C.; Ciesla, L.; Dickinson, M.; Nagar, N.; Magdis, G.; Alexander, D. M.; Béthermin, M.; Demarco, R.; Daddi, E.; Wang, T.; Mullaney, J.; Sargent, M.; Inami, H.; Shu, X.; Bournaud, F.; Chary, R. Coogan, R. T.; Ferguson, H.; Finkelstein, S. L.; Giavalisco, M.; Gómez-Guijarro, C.; Iono, D.; Juneau, S.; Lagache, G.; Lin, L.; Motohara, K.; Okumura, K.; Pannella, M.; Papovich, C.; Pope, A.; Rujopakarn, W.; Silverman, J.; Xiao, M., “*GOODS-ALMA: The slow downfall of star formation in  $z = 2-3$  massive galaxies*”, A&A 643, 30 (2020) [link](#), [pdf](#)
- **Franco, M.**; Elbaz, D.; Zhou, L.; Magnelli, B.; Schreiber, C.; Ciesla, L.; Dickinson, M.; Nagar, N.; Magdis, G.; Alexander, D. M.; Béthermin, M.; Demarco, R.; Daddi, E.; Wang, T.; Mullaney, J.; Inami, H.; Shu, X.; Bournaud, F.; Chary, R.; Coogan, R. T.; Ferguson, H.; Finkelstein, S. L.; Giavalisco, M.; Gómez-Guijarro, C.; Iono, D.; Juneau, S.; Lagache, G.; Lin, L.; Motohara, K.; Okumura, K.; Pannella, M.; Papovich, C.; Pope, A.; Rujopakarn, W.; Silverman, J.; Xiao, M., “*GOODS-ALMA: Using IRAC and VLA to probe fainter millimeter galaxies*”, A&A 643, 53 (2020) [link](#), [pdf](#)
- **Franco, M.**; Elbaz, D.; Béthermin, M.; Magnelli, B.; Schreiber, C.; Ciesla, L.; Dickinson, M.; Nagar, N.; Silverman, J.; Daddi, E.; Alexander, D. M.; Wang, T.; Pannella, M.; Le Floch, E.; Pope, A.; Giavalisco, M.; Maury, A. J.; Bournaud, F.; Chary, R.; Demarco, R.; Ferguson, H.; Finkelstein, S. L.; Inami, H.; Iono, D.; Juneau, S.; Lagache, G.; Leiton, R.; Lin, L.; Magdis, G.; Messias, H.; Motohara, K.; Mullaney, J.; Okumura, K.; Papovich, C.; Pforr, J.; Rujopakarn, W.; Sargent, M.; Shu, X.; Zhou, L., “*GOODS-ALMA: 1.1 mm galaxy survey. I. Source catalog and optically dark galaxies*”, A&A 620, 152 (2018) [link](#), [pdf](#)

- Saxena, A.; Ellis, R. S.; Förster, P. U.; Calabrò, A.; Pentericci, L.; Carnall, A. C.; Castellano, M.; Cullen, F.; Fontana, A.; **Franco, M.**; Fynbo, J. P. U.; Gargiulo, A.; Garilli, B.; Hathi, N. P.; McLeod, D. J.; Amorín, R.; Zamorani, G. , “*The VANDELS Survey: new constraints on the high-mass X-ray binary populations in normal star-forming galaxies at  $3 < z < 5.5$* ”, MNRAS 505, 4798 (2021) [link](#), [pdf](#)
- Gómez-Guijarro, C.; Elbaz, D.; Xiao, M.; Béthermin, M.; **Franco, M.** et al., “*GOODS-ALMA 2.0: Source catalog, number counts, and prevailing compact sizes in 1.1 mm galaxies*”, arXiv:2106.13246 (2021) [link](#), [pdf](#)
- Lovell, C. C.; Geach, J. E.; Davé, R.; Narayanan, D.; Coppin, K. E. K.; Li, Q.; **Franco, M.**; Privon, G. C., “*An orientation bias in observations of submillimetre galaxies*”, arXiv:2106.11588 (2021) [link](#), [pdf](#)
- Thomas, R.; Pentericci, L.; Le Fèvre, O.; Koekemoer, A. M.; Castellano, M.; Cimatti, A.; Fontanot, F.; Gargiulo, A.; Garilli, B.; Talia, M.; Amorín, R.; Bardelli, S.; Cristiani, S.; Cresci, G.; **Franco, M.** et al., “*Less and more IGM-transmitted galaxies from  $z \sim 2.7$  to  $z \sim 6$  from VANDELS and VUDS*”, A&A 650, 63 (2021) [link](#), [pdf](#)
- Garratt, T. K.; Coppin, K. E. K.; Geach, J. E.; Almaini, O.; Hartley, W. G.; Maltby, D. T.; Simpson, C. J.; Wilkinson, A.; Conselice, C. J.; **Franco, M.**; Ivison, R. J.; Koprowski, M. P.; Lovell, C. C.; Pope, A.; Scott, D.; van der Werf, P., “*Cosmic Evolution of the  $H_2$  Mass Density and the Epoch of Molecular Gas*”, ApJ 912, 62 (2021) [link](#), [pdf](#)
- Ramasawmy, J.; Geach, J. E.; Hardcastle, M. J.; Best, P. N.; Bonato, M.; Bondi, M.; Calistro Rivera, G.; Cochrane, R. K.; Conway, J. E.; Coppin, K.; Duncan, K. J.; Dunlop, J. S.; **Franco, M.** et al., “*Low-frequency radio spectra of submillimetre galaxies in the Lockman Hole*”, A&A 648, 14 (2021) [link](#), [pdf](#)
- Garilli, B.; McLure, R.; Pentericci, L.; [...]; **Franco, M.** et al., “*The VANDELS ESO public spectroscopic survey. Final data release of 2087 spectra and spectroscopic measurements*”, A&A 647, 150 (2021) [link](#), [pdf](#)
- Calabrò, A.; Castellano, M.; Pentericci, L.; Fontanot, F.; Menci, N.; Cullen, F.; McLure, R.; Bolzonella, M.; Cimatti, A.; Marchi, F.; Talia, M.; Amorín, R.; Cresci, G.; De Lucia, G.; Fynbo, J.; Fontana, A.; **Franco, M.**; Hathi, N. P.; Hibon, P.; Hirschmann, M. Mannucci, F.; Santini, P.; Saxena, A.; Schaerer, D.; Xie, L.; Zamorani, G., “*The VANDELS survey: The relation between the UV continuum slope and stellar metallicity in star-forming galaxies at  $z \sim 3$* ”, A&A 646, 39 (2021) [link](#), [pdf](#)
- Lagain, A.; Bouley, S.; Baratoux, D.; [...]; **Franco, M.** et al. “*Mars Crater Database: A participative project for the classification of the morphological characteristics of large Martian craters: Large Meteorite Impacts and Planetary Evolution VI*”, Geological Society of America, 550, 29 (2021) [link](#), [pdf](#)
- Zhou, L.; Elbaz, D.; **Franco, M.**; Magnelli, B.; Schreiber, C.; Wang, T.; Ciesla, L.; Daddi, E.; Dickinson, M.; Nagar, N.; Magdis, G.; Alexander, D. M.; Béthermin, M.; Demarco, R.; Mullaney, J.; Bournaud, F.; Ferguson, H.; Finkelstein, S. L.; Giavalisco, M.; Inami, H. Iono, D.; Juneau, S.; Lagache, G.; Messias, H.; Motohara, K.; Okumura, K.; Pannella, M.; Papovich, C.; Pope, A.; Rujopakarn, W.; Shi, Y.; Shu, X.; Silverman, J., “*GOODS-ALMA: Optically dark ALMA galaxies shed light on a cluster in formation at  $z = 3.5$* ”, A&A 642, 155 (2020) [link](#), [pdf](#)
- Popping, G.; Walter, F.; Behroozi, P.; [...]; **Franco, M.** et al., “*The ALMA Spectroscopic Survey in the HUDF: A Model to Explain Observed 1.1 and 0.85 mm Dust Continuum Number Counts*”, ApJ 891, 135 (2019) [link](#), [pdf](#)
- Rujopakarn, W.; Daddi, E.; Rieke, G. H.; Puglisi, A.; Schramm, M.; Pérez-González, P. G.; Magdis, G. E.; Alberts, S.; Bournaud, F.; Elbaz, D.; **Franco, M.**; Kawinwanichakij, L.; Kohno, K.; Narayanan, D.; Silverman, J. D.; Wang, T.; Williams, C. C. “*ALMA 200 pc Resolution Imaging of Smooth Cold Dusty Disks in Typical  $z \sim 3$  Star-forming Galaxies*”, ApJ 882, 107 (2019) [link](#), [pdf](#)
- Wang, T.; Schreiber, C.; Elbaz, D.; Yoshimura, Y.; Kohno, K.; Shu, X.; Yamaguchi, Y.; Pannella, M.; **Franco, M.**; Huang, J.; Lim, C. -E.; Wang, W. -H. “*A dominant population of optically invisible massive galaxies in the early Universe*”, Nature 572, 7768 (2019) [link](#), [pdf](#)
- McLure, R. J.; Pentericci, L.; Cimatti, A.; [...]; **Franco, M.** et al., “*The VANDELS ESO public spectroscopic survey*”, MNRAS 479, 1 (2018) [link](#), [pdf](#)
- Pentericci, L.; McLure, R. J.; Garilli, B.; [...]; **Franco, M.** et al., “*The VANDELS ESO public spectroscopic survey: Observations and first data release*”, A&A 616, 174 (2018) [link](#), [pdf](#)
- Elbaz, D.; Leiton, R.; Nagar, N.; Okurama, K; **Franco, M.** et al., “*Starbursts in and out of the star-formation main sequence*”, A&A 616, A110 (2018) [link](#), [pdf](#)
- Schreiber, C.; Elbaz, D.; Pannella, M.; Ciesla, L.; Wang, T. and **Franco, M.** , “*Dust temperature and mid-to-total infrared color distributions for star-forming galaxies at  $0 < z < 4$* ”, A&A 609, A30 (2018) [link](#), [pdf](#)