

# Dr. Benito Marcote

*Curriculum Vitae — February 2020*

*Joint Institute for VLBI ERIC (JIVE)  
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## Employment

- 2019–current **Permanent Support Scientist of the European VLBI Network (EVN)**, at the Joint Institute for VLBI ERIC (JIVE), The Netherlands.
- 2016–2019 **Support Scientist of the European VLBI Network (EVN)**, at the Joint Institute for VLBI ERIC (JIVE), The Netherlands.
- 2011–2015 **Predoctoral Fellowship**, *Formación de Personal Investigador (FPI) from the Ministry of Economy and Competitiveness of Spain (MINECO)*, at the University of Barcelona, Spain.
- 07–09/2010 **JAÉ-Intro**, *Introduction to research fellowship for undergraduates from the Spanish National Research Council (CSIC)*, at the Instituto de Física Corpuscular (IFIC) / University of Valencia.
- 10/09–07/10 **Introduction to Research**, *undergraduate part-time fellowship*, at the Instituto de Física de Cantabria (IFCA) & University of Cantabria, Spain.

## Experience with Astronomical Observations

- Radio EVN, GMRT, LBA, VLA, LOFAR, WSRT
- X-rays *XMM-Newton, Chandra, NuSTAR* (limited)
- TeV MAGIC (limited)
- Sources Fast Radio Bursts, Gamma-Ray Binaries, Colliding-Wind Binaries, High Mass X-Ray Binaries, Gravitational Wave events, Active Galactic Nuclei

## Computer skills

- OSs GNU/Linux, Mac OS
- Languages **Python**, C, Ruby, Java, HTML, CSS, (limited: Octave, Ada, Fortran)
- Sci. packages AIPS, CASA, Difmap, ParselTongue, Sched, Xspec (limited: QDP, Iraf, Maple)
- Typesetting L<sup>A</sup>T<sub>E</sub>X, Vim, LibreOffice, iWork

## Education

- 2011–2015 **Ph.D. in Physics**, *University of Barcelona, Spain, Excellent Cum Laude with International Doctor Mention (the maximum grade in Spain).*  
THESIS: *Non-thermal emission from high-energy binaries through interferometric radio observations* (arXiv:1603.09276). Defended on 27 October 2015 and supervised by Marc Ribó and Josep M. Paredes.
- 2011–2012 **Master in Astrophysics, Particle Physics and Cosmology**,  
*University of Barcelona, Spain.*  
THESIS: *Low Frequency Radio Observations of Gamma-Ray Binaries*, supervised by Josep M. Paredes
- 2006–2011 **Physics Degree**, *University of Cantabria, Spain, GPA – 8.4/10 (2.6/4).*  
THESIS: *X-Ray Emission in Nearby Galaxies*, supervised by Xavier Barcons

## Participation in projects & other grants, awards

- 2018 **AHEAD Trans-National Access programme**, 10-day training visit granted from the European Union's Horizon 2020 Programme under the AHEAD project (grant agreement 654215).  
10-day X/gamma-ray data training at INAF Bologna.
- 2016–2019 **Multidisciplinary approach to high-energy processes in astrophysical outflows: theory and observations**, R&D&I National Program of the Ministry of Economy and Competitiveness of Spain (MINECO), AYA2016-76012-C3-1-P.  
J. M. Paredes (PI), V. Bosch-Ramon, J. Núñez, P. Munar-Adrover, **B. Marcote**, J. Moldón, F. L. Vieyro, G. E. Romero. Funding: 142,000 €
- 2014–2016 **Non-thermal high-energy processes in astrophysical outflows. Theory and multi-wavelength observations**, R&D&I National Program of the Ministry of Economy and Competitiveness of Spain (MINECO), AYA2013-47447-C3-1-P.  
J. M. Paredes (PI), S. Migliari, G. E. Romero, J. Moldón, P. Munar-Adrover, **B. Marcote**, X. Paredes-Fortuny, V. M. de la Cita, A. Comastri, R. Gilli, C. Vignali, J. A. Combi, R. K. Zamanov. Funding: 157,000 €

## Publications

**NOTE:** Titles link to abstracts in the SAO/NASA Astrophysics Data System.

- Peer-reviewed articles
- ★ *Periodic activity from a fast radio burst source* 2020  
The CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, K. M. Bandura, M. Bhardwaj, P. J. Boyle, C. Brar, P. Chawla, T. Chen, J. F. Cliche, D. Cubranic, M. Deng, N. T. Denman, M. Dobbs, F. Q. Dong, M. Fandino, E. Fonseca, B. M. Gaensler, U. Giri, D. C. Good, M. Halpern, J. W. T. Hessels, A. S. Hill, C. Höfer, A. Josephy, J. W. Kania, R. Karuppusamy, V. M. Kaspi, A. Keimpema, F. Kirsten, T. L. Landecker, D. A. Lang, C. Leung, D. Z. Li, H.-H. Lin, **B. Marcote**, K. W. Masui, R. Mckinven, J. Mena-Parra, M. Merryfield, D. Michilli, N. Milutinovic, A. Mirhosseini, A. Naidu, L. B. Newburgh, C. Ng, K. Nimmo, Z. Paragi, C. Patel, U.-L. Pen, T. Pinsonneault-Marotte, Z. Pleunis, M. Rafiei-Ravandi, M. Rahman, S. M. Ransom, A. Renard, P. Sanghavi, P. Scholz, J. R. Shaw, K. Shin, S. R. Siegel, S. Singh, R. J. Smegal, K. M. Smith, I. H. Stairs, S. P. Tendulkar, I. Tret'yakov, K. Vanderlinde, H. Wang, X. Wang, D. Wulf, P. Yadav, A. V. Zwaniga. arXiv:2001.10275
  - ★ *A repeating fast radio burst source localized to a nearby spiral galaxy* 2020  
**B. Marcote**, K. Nimmo, J. W. T. Hessels, S. P. Tendulkar, C. G. Bassa, Z. Paragi, A. Keimpema, M. Bhardwaj, R. Karuppusamy, V. M. Kaspi, C. J. Law, D. Michilli, K. Aggarwal, B. Andersen, A. M. Archibald, K. Bandura, G. C. Bower, P. J. Boyle, C. Brar, S. Burke-Spolaor, B. J. Butler, T. Cassanelli, P. Chawla, P. Demorest, M. Dobbs, E. Fonseca, U. Giri, D. C. Good, K. Gourdji, A. Josephy, A. Yu. Kirichenko, F. Kirsten, T. L. Landecker, D. Lang, T. J. W. Lazio, D. Z. Li, H.-H. Lin, J. D. Linford, K. Masui, J. Mena-Parra, A. Naidu, C. Ng, C. Patel, U.-L. Pen, Z. Pleunis, M. Rafiei-Ravandi, M. Rahman, A. Renard, P. Scholz, S. R. Siegel, K. M. Smith, I. H. Stairs, K. Vanderlinde, A. V. Zwaniga. *Nature*, 577, 190  
\* Also appeared highlighted in the News & Views section of *Nature* (9 January 2020).  
\* Presented in a Press Conference at the AAS 235th in Hawai'i (USA) on 6 January 2020.
  - ★ *VLBI observations of the G25.65+1.05 water maser superburst* 2020  
R. A. Burns, G. Orosz, O. Bayandina, G. Surcis, M. Olech, G. MacLeod, A. Volvach, G. Rudnitskii, T. Hirota, K. Immer, J. Blanchard, **B. Marcote**, H. J. van Langevelde, J. O. Chibueze, K. Sugiyama, Kee-Tae Kim, I. Val'tts, N. Shakhvorostova, B. Kramer, W. A. Baan, C. Brogan, T. Hunter, S. Kurtz, A. M. Sobolev, J. Brand, L. Volvach. *MNRAS*, 491, 4069
  - ★ *Probing the origin of the unpulsed emission from the pulsars B0525+21 and B2045–16* 2019  
**B. Marcote**, Y. Maan, Z. Paragi, A. Keimpema, *A&A*, 627, L2
  - ★ *Resolving the decades-long transient FIRST J141918.9+394036: an orphan long gamma-ray burst or a young magnetar nebula?* 2019  
**B. Marcote**, K. Nimmo, O. S. Salafia, Z. Paragi, J. W. T. Hessels, E. Petroff, R. Karuppusamy. *ApJ*, 876, L14

- ★ *FRB 121102 Bursts Show Complex Time-Frequency Structure* 2019  
J. W. T. Hessels, L. G. Spitler, A. D. Seymour, J. M. Cordes, D. Michilli, R. S. Lynch, K. Gourdji, A. M. Archibald, C. G. Bassa, G. C. Bower, S. Chatterjee, L. Connor, F. Crawford, J. S. Deneva, V. Gajjar, V. M. Kaspi, A. Keimpema, C. J. Law, **B. Marcote**, M. A. McLaughlin, Z. Paragi, E. Petroff, S. M. Ransom, P. Scholz, B. W. Stappers, S. P. Tendulkar. *ApJ*, 876, L23
- ★ *Compact radio emission indicates a structured jet was produced by a binary neutron star merger* 2019  
G. Ghirlanda, O. S. Salafia, Z. Paragi, M. Giroletti, J. Yang, **B. Marcote**, J. Blanchard, I. Agudo, T. An, M. G. Bernardini, R. Beswick, M. Branchesi, S. Campana, C. Casadio, E. Chassande-Mottin, M. Colpi, S. Covino, P. D'Avanzo, V. D'Elia, S. Frey, M. Gawronski, G. Ghisellini, L. I. Gurvits, P. G. Jonker, H. J. van Langevelde, A. Melandri, J. Moldon, L. Nava, A. Perego, M. A. Perez-Torres, C. Reynolds, R. Salvaterra, G. Tagliaferri, T. Venturi, S. D. Vergani, M. Zhang. *Science*, 363, 6430, 968
- ★ *Refining the origins of the gamma-ray binary 1FGL J1018.6–5856* 2018  
**B. Marcote**, M. Ribó, J. M. Paredes, M. Y. Mao, P. G. Edwards. *A&A*, 619, A26
- ★ *Constraining very-high-energy and optical emission from FRB 121102 with the MAGIC telescopes* 2018  
MAGIC Collaboration (129 authors), and **B. Marcote** (*corresponding author*), L. G. Spitler, J. W. T. Hessels, K. Kashiyama, K. Murase, V. Bosch-Ramon, D. Michilli, A. Seymour. *MNRAS*, 481, 2, 2479  
Corresponding authors: T. Hassan, J. Hoang, S. Inoue, and B. Marcote.
- ★ *An extreme magneto-ionic environment associated with the fast radio burst source FRB 121102* 2018  
D. Michilli, A. Seymour, J. W. T. Hessels, L. G. Spitler, V. Gajjar, A. M. Archibald, G. C. Bower, S. Chatterjee, J. M. Cordes, K. Gourdji, G. H. Heald, V. M. Kaspi, C. J. Law, C. Sobey, E. A. K. Adams, C. G. Bassa, S. Bogdanov, C. Brinkman, P. Demorest, F. Fernandez, G. Hellbourg, T. J. W. Lazio, R. S. Lynch, N. Maddox, **B. Marcote**, M. A. McLaughlin, Z. Paragi, S. M. Ransom, P. Scholz, A. P. V. Siemion, S. P. Tendulkar, P. Van Rooy, R. S. Wharton, D. Whitlow. *Nature*, 553, 182  
\* Appeared in the cover of Nature (11 January 2018).
- ★ *Multi-messenger Observations of a Binary Neutron Star Merger* 2017  
B. P. Abbott, et al., including **B. Marcote** for the Euro VLBI Team. *ApJ*, 848, L12
- ★ *Simultaneous X-ray, gamma-ray, and Radio Observations of the repeating Fast Radio Burst FRB 121102* 2017  
P. Scholz, S. Bogdanov, J. W. T. Hessels, R. S. Lynch, L. G. Spitler, C. G. Bassa, G. C. Bower, S. Burke-Spolaor, B. J. Butler, S. Chatterjee, J. M. Cordes, K. Gourdji, V. M. Kaspi, C. J. Law, **B. Marcote**, M. A. McLaughlin, D. Michilli, Z. Paragi, S. M. Ransom, A. Seymour, S. P. Tendulkar, R. S. Wharton. *ApJ*, 846, 80S
- ★ *FRB 121102 is coincident with a star forming region in its host galaxy* 2017  
C. G. Bassa, S. P. Tendulkar, E. A. K. Adams, N. Maddox, S. Bogdanov, G. C. Bower, S. Burke-Spolaor, B. J. Butler, S. Chatterjee, J. M. Cordes, J. W. T. Hessels, V. M. Kaspi, C. J. Law, **B. Marcote**, Z. Paragi, S. M. Ransom, P. Scholz, L. G. Spitler, H. J. van Langevelde. *ApJL*, 843, L8
- ★ *A model for the repeating FRB 121102 in the AGN scenario* 2017  
F. L. Vieyro, G. E. Romero, V. Bosch-Ramon, **B. Marcote**, M. V. del Valle. *A&A*, 602, A64
- ★ *Towards the origin of the radio emission in AR Scorpii, the first radio-pulsing white dwarf binary* 2017  
**B. Marcote**, T. R. Marsh, E. R. Stanway, Z. Paragi, J. M. Blanchard. *A&A*, 601, L7
- ★ *The First Simultaneous X-ray/Radio Detection of the First Be/BH System MWC 656* 2017  
M. Ribó, P. Munar-Adrover, J. M. Paredes, **B. Marcote**, K. Iwasawa, J. Moldón, J. Casares, S. Migliari, X. Paredes-Fortuny, *ApJL*, 835, L33

- ★ *A direct localization of a fast radio burst and its host* 2017  
S. Chatterjee, C. J. Law, R. S. Wharton, S. Burke-Spolaor, J. W. T. Hessels, G. C. Bower, J. M. Cordes, S. P. Tendulkar, C. G. Bassa, P. Demorest, B. J. Butler, A. Seymour, P. Scholz, M. W. Abruzzo, S. Bogdanov, V. M. Kaspi, A. Keimpema, T. J. W. Lazio, **B. Marcote**, M. A. McLaughlin, Z. Paragi, S. M. Ransom, M. Rupen, L. G. Spitler, H. J. van Langevelde, *Nature*, 541, 58  
\* Appeared in the cover and in the News & Views section of Nature (5 January 2017).
- ★ *The Repeating Fast Radio Burst FRB 121102 as Seen on Millisecond Angular Scales* 2017  
**B. Marcote**, Z. Paragi, J. W. T. Hessels, A. Keimpema, H. J. van Langevelde, Y. Huang, C. G. Bassa, S. Bogdanov, G. C. Bower, S. Burke-Spolaor, B. J. Butler, R. M. Campbell, S. Chatterjee, J. M. Cordes, P. Demorest, M. A. Garrett, T. Ghosh, V. M. Kaspi, C. J. Law, T. J. W. Lazio, M. A. McLaughlin, S. M. Ransom, C. J. Salter, P. Scholz, A. Seymour, A. Siemion, L. G. Spitler, S. P. Tendulkar, R. S. Wharton, *ApJL*, 834, L8  
\* Appeared in the Research Highlight section of Nature Astronomy (2017, 1, 2, article 50)
- ★ *The Host Galaxy and Redshift of the Repeating Fast Radio Burst FRB 121102* 2017  
S. P. Tendulkar, C. G. Bassa, J. M. Cordes, G. C. Bower, C. J. Law, S. Chatterjee, E. A. K. Adams, S. Bogdanov, S. Burke-Spolaor, B. J. Butler, P. Demorest, J. W. T. Hessels, V. M. Kaspi, T. J. W. Lazio, N. Maddox, **B. Marcote**, M. A. McLaughlin, Z. Paragi, S. M. Ransom, P. Scholz, A. Seymour, L. G. Spitler, H. J. van Langevelde, R. S. Wharton, *ApJL*, 834, L7
- ★ *FRB 150418: clues to its nature from European VLBI Network and e-MERLIN observations* 2016  
M. Giroletti, **B. Marcote**, M. Garrett, Z. Paragi, J. Yang, K. Hada, T. W. B. Muxlow, C. C. Cheung, *A&A*, 593, L16
- ★ *Orbital and superorbital variability of LS I +61 303 at low radio frequencies with GMRT and LOFAR* 2016  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, J. D. Swinbank, J. W. Broderick, S. Markoff, R. Fender, R. A. M. J. Wijers, G. G. Pooley, A. J. Stewart, M. E. Bell, R. P. Breton, D. Carbone, S. Corbel, J. Eislöffel, H. Falcke, J.-M. Grießmeier, M. Kuniyoshi, M. Pietka, A. Rowlinson, M. Serylak, A. J. van der Horst, J. van Leeuwen, M. W. Wise, P. Zarka, *MNRAS*, 456, 2, 1791
- ★ *A radio-map of the colliding winds in the very massive binary system HD 93129A* 2015  
P. Benaglia, **B. Marcote**, J. Moldón, E. Nelán, M. de Becker, S. M. Dougherty, B. S. Koribalski, *A&A*, 579, A99
- ★ *Physical properties of the gamma-ray binary LS 5039 through low and high frequency radio observations* 2015  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, *MNRAS*, 451, 4578
- ★ *In quest of non-thermal signatures in early-type stars* 2015  
J. Martí, P. L. Luque-Escamilla, J. Casares, **B. Marcote**, X. Paredes-Fortuny, M. Ribó, J. M. Paredes, J. Núñez, *Ap&SS*, 356, 277

#### Proceedings

- ★ *Searching for optical and VHE counterparts of fast radio bursts with MAGIC* 2019  
J. Hoang, M. Will, S. Inoue, J. A. Barrio, J. Cortina, M. Lopez, **B. Marcote**, L. A. Tejedor. 36th International Cosmic Ray Conference (ICRC2019), held on July 24–August 1, 2019, in Madison, U.S.A.
- ★ *Localizations of Fast Radio Bursts on millisecond scales* 2018  
**B. Marcote**, Z. Paragi. 14th European VLBI Network (EVN) Symposium and Users Meeting held on October 8–11, 2018, in Granada, Spain. PoS(EVN2018)013
- ★ *Multi-epoch VLBI of a double maser super-burst* 2018  
R. A. Burns, O. Bayandina, G. Orosz, M. Olech, K. Immer, J. Blanchard, **B. Marcote**, H. Van Langevelde, T. Hirota, K. T. Kim, I. Val'tts, N. Shakhvorostova, G. Rudnitskii, A. Volvach, L. Volvach, G. MacLeod, J. O. Chibueze, G. Surcis, B. Kramer, W. Baan, C. L. Brogan, T. Hunter, S. Kurtz. 14th European VLBI Network (EVN) Symposium and Users Meeting held on October 8–11, 2018, in Granada, Spain. PoS(EVN2018)075

- ★ *Review on the multiwavelength emission of the gamma-ray binary LS I +61 303* 2017  
**B. Marcote**. XII Multifrequency Behavior of High Energy Cosmic Sources Workshop held on June 12–17, 2017, in Palermo, Italy. PoS(MULTIF2017)045
- ★ *The origin of the Fast Radio Bursts, still an open question* 2017  
**B. Marcote**, M. Giroletti, M. Garrett, Z. Paragi, J. Yuang, K. Hada, C. C. Cheung. XII Scientific Meeting of the Spanish Astronomical Society held on July 18–22, 2016, in Bilbao, Spain. p. 511
- ★ *Measuring the expansion velocity of the outflows of LS I +61 303 through low-frequency radio observations* 2017  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, J. D. Swinbank, J. W. Broderick, S. Markoff, R. Fender, R. A. M. J. Wijers, G. G. Pooley, A. J. Stewart, M. E. Bell, R. P. Breton, D. Carbone, S. Corbel, J. Eislöffel, H. Falcke, J.-M. Grießmeier, M. Kuniyoshi, M. Pietka, A. Rowlinson, M. Serylak, A. J. van der Horst, J. van Leeuwen, M. W. Wise, P. Zarka  
AIP Conference Proceedings, 1792, 1, 040018
- ★ *Physical properties of the gamma-ray binary LS 5039 through low and high frequency radio observations* 2015  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra. High Energy Phenomena in Relativistic Outflows V. AAA Workshop Series 8
- ★ *Orbital and superorbital variability of LS I +61 303 at low radio frequencies with GMRT and LOFAR* 2015  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, J. D. Swinbank, J. W. Broderick, S. Markoff, R. Fender, R. A. M. J. Wijers, G. G. Pooley, A. J. Stewart, M. E. Bell, R. P. Breton, D. Carbone, S. Corbel, J. Eislöffel, H. Falcke, J.-M. Grießmeier, M. Kuniyoshi, M. Pietka, A. Rowlinson, M. Serylak, A. J. van der Horst, J. van Leeuwen, M. W. Wise, P. Zarka  
High Energy Phenomena in Relativistic Outflows V. AAA Workshop Series 8
- ★ *Discovering the colliding wind binary HD 93129A* 2014  
**B. Marcote**, P. Benaglia, J. Moldón, E. Nelan, M. de Becker, S. M. Dougherty and B. S. Koribalski  
PoS(EVN 2014)57 12th European VLBI Network Symposium and Users Meeting
- ★ *The changing morphology of the radio outflow of HESS J0632+057 along its orbit* 2014  
**B. Marcote**, J. Moldón, M. Ribó, J. M. Paredes, Z. Paragi  
PoS(EVN 2014)95 12th European VLBI Network Symposium and Users Meeting
- ★ *GMRT and LOFAR low frequency observations of the gamma-ray binaries LS 5039 and LS I +61 303* 2014  
**B. Marcote**, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, J. Swinbank, J. Broderick, R. Fender, S. Markoff, R. Wijers  
ASI Conference Series, 13, 29
- ★ *First LOFAR Observations of Gamma-Ray Binaries* 2012  
**B. Marcote**, M. Ribó, J. M. Paredes, J. Swinbank, J. Broderick, R. Fender, S. Markoff, R. Wijers  
HIGH ENERGY GAMMA-RAY ASTRONOMY: 5th International Meeting on High Energy Gamma-Ray Astronomy. AIPCP, 1505, 374–377

#### Telegrams/Circulars

- ★ *First EVN measurements of the transient FIRST J141918.9+394036 on milliarcsecond scales* 18/10/2018  
**B. Marcote**, Z. Paragi, J. W. T. Hessels. ATel #12126
- ★ *LIGO/Virgo G298048 - Record of all e-MERLIN results to date on SSS17a* 28/09/2017  
J. Moldón, R. Beswick, Z. Paragi, I. Agudo, T. An, P. Bacon, C. Casadio, E. Chassande-Mottin, S. Frey, M. Giroletti, P. Jonker, M. Kettenis, **B. Marcote**, A. Szomoru, H. J. van Langevelde, J. Yang for the Euro VLBI Team. GCN 21940
- ★ *LIGO/Virgo G298048 - Further European VLBI Network (EVN) observations of SSS17a* 28/09/2017  
Z. Paragi, J. Yang, **B. Marcote**, et al. for the Euro VLBI Team. GCN 21939
- ★ *LIGO/Virgo G298048: e-MERLIN upper limits on 5 GHz compact emission from SSS17a* 04/09/2017  
J. Moldón, R. Beswick, Z. Paragi, I. Agudo, T. An, P. Bacon, C. Casadio, E. Chassande-Mottin, S. Frey, M. Giroletti, P. Jonker, M. Kettenis, **B. Marcote**, A. Szomoru, H. J. van Langevelde, J. Yang for the Euro VLBI Team. GCN 21804



★ *LIGO/Virgo G298048: European VLBI Network (EVN) upper limit on 5 GHz compact emission from SSS17a* 30/08/2017  
 Z. Paragi, I. Agudo, T. An, P. Bacon, R. Beswick, C. Casadio, E. Chassande-Mottin, S. Frey, M. Giroletti, P. Jonker, M. Kettenis, **B. Marcote**, A. Szomoru, H. van Langevelde, J. Yang for the Euro VLBI Team. GCN 21763

★ *EVN measurement of the FRB 150418 host galaxy candidate and its stability on VLBI scales* 16/04/2016  
**B. Marcote**, M. Giroletti, M. Garrett, J. Yang, Z. Paragi, K. Hada, C. C. Cheung. ATel #8959

★ *EVN limits to compact millisecond-scale radio emission from the proposed galaxy counterpart to FRB 150418* 24/03/2016  
**B. Marcote**, M. Giroletti, M. Garrett, J. Yang, Z. Paragi, K. Hada, C. C. Cheung. ATel #8865

#### Other contributions

★ *Science with e-ASTROGAM: A space mission for MeV–GeV gamma-ray astrophysics* 2018  
 A. De Angelis, V. Tatischeff, I. A. Grenier et al. (White book) Journal of High Energy Astrophysics, vol. 19, pag. 1–106  
 Contributed to the section “Unidentified gamma-ray sources”, J. M. Paredes, V. Bosch-Ramon & **B. Marcote**, p. 98

★ *Non-thermal emission from high-energy binaries through interferometric radio observations* 2015  
**B. Marcote**, Ph.D. Thesis. University of Barcelona, Spain (arXiv:1603.09276)

Collaborations As member of the MAGIC Collaboration, I appear as coauthor in ~60 papers (mostly in peer-reviewed journals) published by the Collaboration. You can find all of them looking at SAO/NASA ADS.

### Granted observing proposals

A total of 485.5 h granted as PI and 853 h as co-PI, including observations from radio to TeV energies.

- November 2019 **MAGIC**, 65 hr, co-PI (PI: J. Hoang).  
MWL observation of repeating Fast Radio Bursts
- September 2019 **European VLBI Network (EVN)**, 5 h, co-PI (PI: H. Vedantham), project code RV002 (Target of Opportunity).  
Astrometric shifts induced by the ionized coma of the interstellar visitor comet C/2019 Q4
- September 2019 **European VLBI Network (EVN)**, 16 h, co-PI (PI: G. Ghirlanda), project code RG010 (Target of Opportunity).  
Radio imaging of the close-by long GRB 190829A
- July 2019 **Giant Metrewave Radio Telescope (GMRT)**, 6 h, co-PI (PI: Y. Maan), project code 37\_131.  
Scintillation-based search for off-pulse emission from pulsars B2045–16 and B0525+21
- June 2019 **Australian Long Baseline Array (LBA)**, 58 h, co-PI (PI: P. Edwards), project code V589.  
A first epoch LBA observation of a new gamma-ray binary
- June 2019 **Australian Long Baseline Array (LBA)**, 28 h, PI, project code V191.  
Determining near-periastron properties of the hottest and most luminous colliding-wind binary with LBA
- June 2019 **Australian Telescope Compact Array (ATCA)**, 48 h, co-PI (PI: P. Benaglia), project code C3302.  
Determining near-periastron properties of the hottest and most luminous colliding-wind binary with ATCA
- June 2019 **European VLBI Network (EVN)**, 35 h, co-PI (PI: K. Nimmo), project code EN005.  
A Repeating Fast Radio Burst Survey: Precise Localization and Radio Counterparts
- January 2019 **European VLBI Network (EVN)**, 4 h, PI, RSM03 (short proposal).  
Exploring the mas structure of a new and unique gamma-ray binary
- January 2019 **MeerKAT**, 10 h, co-PI (PI: I. M. Monageng).  
Monitoring gamma-ray binaries with MeerKAT

- December 2018 **Australian Telescope Compact Array (ATCA)**, 16 hr, co-PI (PI: P. Benaglia), C3302.  
Determining near-periastron properties of the hottest and most luminous colliding-wind binary with ATCA
- December 2018 **Australian Telescope Compact Array (ATCA)**, 8 hr, co-PI (PI: J. Callingham), C3267.  
Sampling the orbit of the newly discovered and brightest non-thermal radio-emitting colliding wind binary
- November 2018 **MAGIC**, 25 hr, co-PI (PI: J. Hoang).  
Exploring fast radio bursts in the VHE and optical bands
- November 2018 **e-MERLIN**, 72 h, co-PI (PI: J. Moldón), project code CY8003.  
The e-MERLIN view of the radio counterpart of GW events during O3
- October 2018 **European VLBI Network (EVN)**, 56 hr, PI, project code EM135.  
Precise localizations of Fast Radio Bursts and their persistent counterparts
- October 2018 **European VLBI Network (EVN)**, 120 hr, co-PI (PI: M. Giroletti), project code EG107.  
The High angular resolution view of the afterglow of GW events during O3
- September 2018 **European VLBI Network (EVN)**, 7 hr, PI, RM015 (Target of Opportunity).  
The fading of a possible long Gamma-Ray Burst in a Fast Radio Burst-like environment
- August 2018 **Karl G. Jansky Very Large Array (VLA)**, 1.5 hr, PI, project code VLA/19A-201.  
Probing the origin of the unpulsed emission from pulsars B0525+21 and B2045-16
- July 2018 **Giant Metrewave Radio Telescope (GMRT)**, 15 hr, PI, project code 35\_093.  
Unveiling the nature of the newly discovered and brightest non-thermal radio-emitting colliding wind binary
- July 2018 **Giant Metrewave Radio Telescope (GMRT)**, 36 hr, co-PI (PI: V. R. Gajjar), 35\_039.  
Low-frequency follow-up of FRB 121102 from the uGMRT
- July 2018 **Australian Telescope Compact Array (ATCA)**, 36 hr, co-PI (PI: J. Callingham), C3267.  
Sampling the orbit of the newly discovered and brightest non-thermal radio-emitting colliding wind binary
- March 2018 **European VLBI Network (EVN)**, 15 hr, PI, EM133.  
Markarian 622: a curious example of a binary AGN
- March 2018 **European VLBI Network (EVN)**, 16 hr, co-PI (PI: G. Ghirlanda), ToO, RG009.  
Unveiling the structure of the outflow of GW 170817
- December 2017 **Australian Long Baseline Array (LBA)**, 7 hr, co-PI (PI: G. Ghirlanda), V567.  
Do binary neutron star mergers always produce a jet?
- November 2017 **MAGIC**, 50 hr, co-I (PI: A. Fernández-Barral), proposal ID: G10.  
G70.7+1.2: New VHE binary system?
- October 2017 **European VLBI Network (EVN)**, 16 hr, PI, EM132.  
Unveiling the origin of the radio emission in the gamma-ray binary LS I +61 303
- October 2017 **Global VLBI (EVN + VLBA)**, 16 hr, co-PI (PI: G. Ghirlanda), GG084.  
Do binary neutron star mergers always produce a jet?
- September 2017 **Green Bank Telescope (GBT)**, 12 hr, PI, DDT, GBT-17B-396.  
Studying FRB 121102 at 5 GHz and improving its localization to pc scales
- August 2017 **European VLBI Network (EVN)**, 5 hr, PI, ToO, RM013.  
Localizing the bursts of FRB 121102 during an active period
- August 2017 **European VLBI Network (EVN)**, 4 hr, co-PI (PI: Z. Paragi), ToO, RP029.  
An electromagnetic counterpart to the gravitational-wave event G298048
- July 2017 **Giant Metrewave Radio Telescope (GMRT)**, 18 hr, PI, 33\_007.  
Discovering the radio nebula associated with Geminga, one of the most energetic gamma-ray pulsar
- July 2017 **Giant Metrewave Radio Telescope (GMRT)**, 24 hr, co-PI (PI: Y. Maan), 33\_056.  
Deep interferometric and time-domain search for emission from radio-quiet gamma-ray pulsars: A pilot study
- June 2017 **Australian Long Baseline Array (LBA)**, 10 hr, PI, V565.  
Resolving the enigmatic source 2XMM J160050.7–514245: An Extreme Radio Bright Colliding Wind Binary Candidate
- June 2017 **European VLBI Network (EVN)**, 22.5 hr, PI, EM131.  
Unveiling the existence of wind collision regions on massive binary stars

- June 2017 **European VLBI Network (EVN)**, 16 hr, PI, EM130.  
In quest of the origin of the Fast Radio Burst FRB 150418
- March 2017 **European VLBI Network (EVN)**, 16 hr, co-PI (PI: Z. Paragi), ToO, RP027.  
e-EVN follow-up of AGL J1914+1043
- March 2017 **The Low Frequency Array (LOFAR)**, 16 hr, PI, LC8\_026.  
The low-frequency emission of the persistent source associated with FRB 121102
- March 2017 **European VLBI Network (EVN)**, 8 hr, PI, EM129.  
Exploring the puzzling origin of the radio nebula G70.7+1.2
- October 2016 **European VLBI Network (EVN)**, 72 hr, co-PI (PI: J. Hessels), EP103.  
Proper Motion and Variability of FRB 121102
- October 2016 **European VLBI Network (EVN)**, 25 hr, co-PI (PI: Y. Maan), EM127.  
Probing the off-pulse emission from pulsars B0525+21 and B2045-16
- October 2016 **MAGIC**, 25 hr, co-PI (PI: S. Inoue & J. Cortina), regular proposal.  
Exploring fast radio bursts in the VHE and optical bands
- September 2016 **MAGIC**, +4 hr, co-PI (PI: S. Inoue & J. Cortina), ToO proposal.  
ToO observations of the FRB repeater simultaneous with Arecibo and Effelsberg
- September 2016 **European VLBI Network (EVN)**, 17 hr, co-PI (PI: J. Hessels), ToO, RP026.  
Pinpointing the Position of Fast Radio Burst FRB 121102
- June 2016 **Australian Long Baseline Array (LBA)**, 8 hr, co-PI (PI: T. Marsh), V548.  
A unique radio emitting white dwarf binary
- June 2016 **Australian Long Baseline Array (LBA)**, 48 hr, PI, V454.  
On the origin of the gamma-ray binary 1FGL J1018.6-5856
- June 2016 **European VLBI Network (EVN)**, 5 hr, PI, EM125.  
Unveiling the radio counterpart of the possible gamma-ray binary HESS J1832-093
- May 2016 **The Low Frequency Array (LOFAR)**, 4.5 hr, PI, ToO, DDT6\_002.  
Cygnus X-1 in the hard state: the low frequency follow-up
- March 2016 **Chandra & Very Large Array (VLA)**, 2 hr, co-PI (PI: M. Ribó), SI0460.  
Accretion/ejection coupling in the second Be/BH system
- March 2016 **European VLBI Network (EVN)**, 5 hr, co-PI (PI: M. Garrett), ToO, RG008.  
e-VLBI observations of FRB 150418
- February 2016 **European VLBI Network (EVN)**, 14 hr, PI, EM121.  
The possible connection of a compact radio source and an unidentified TeV source
- September 2015 **The Low Frequency Array (LOFAR)**, 36 hr, PI, LC5\_022.  
Multifrequency campaign with coordinated GMRT and LOFAR observations: First detailed study of a gamma-ray binary outburst at 150 MHz and search for extended emission
- July 2015 **Giant Metrewave Radio Telescope (GMRT)**, 30 hr, PI, 29\_060.  
Multifrequency campaign with coordinated GMRT and LOFAR observations: Probing the colliding-wind scenario in the gamma-ray binary LS I +61 303
- March 2014 **Chandra & Very Large Array (VLA)**, 6 hr, co-PI (PI: M. Ribó), SG0905.  
Chandra proposal with coordinated VLA observation: Accretion/ejection coupling in the first Be/BH system
- October 2013 **European VLBI Network (EVN)**, 10 hr, PI, EM111.  
Morphological changes of the extended emission of HESS J0632+057
- March 2013 **Westerbork Synthesis Radio Telescope (WSRT)**, 20 hr, PI, R13B012.  
Multifrequency campaign with coordinated GMRT and WSRT observations: Unveiling the absorption mechanism in the gamma-ray binary LS 5039
- January 2013 **Giant Metrewave Radio Telescope (GMRT)**, 32 hr, PI, 24\_001.  
Multifrequency campaign with coordinated GMRT and WSRT observations: Understanding the low frequency phenomena in the gamma-ray binary LS 5039
- November 2012 **Westerbork Synthesis Radio Telescope (WSRT)**, 5 hr, PI, S12B003.  
Is TYC 4051-1277-1 a new gamma-ray binary?



- January 2012 **Very Large Array (VLA)**, 3 hr, PI, 12B-061.  
Search for radio emission from HD 215227: the newest gamma-ray binary candidate
- October 2011 **Westerbork Synthesis Radio Telescope (WSRT)**, 30 hr, PI, S11B/013.  
Service time proposal: Search for radio emission from HD 215227: the newest gamma-ray binary candidate

## Talks

- 06/01/2020 **A repeating fast radio burst source localized to a nearby spiral galaxy**, *B. Marcote & K. Nimmo*, [Press Conference](#) at the 235th American Astronomical Society meeting, Honolulu, U.S.A..
- 16/10/2019 **Resolving a decades-long transient: A possible connection between an orphan long FRB afterglow and FRBs**, *B. Marcote*, Contributed talk at the SKA-VLBI Science Projects and Operations Workshop, Jodrell Bank Observatory, United Kingdom.
- 05/09/2019 **Resolving the origin of the radio structure of LS I +61 303**, *B. Marcote*, [Invited talk](#) at the Variable Galactic Gamma-Ray Sources (VGGRS V), Barcelona, Spain.
- 12/07/2019 **Resolving a decades-long transient: an orphan long gamma-ray burst or a young magnetar nebula?**, *B. Marcote*, Contributed talk at HEPRO VII, Barcelona, Spain.
- 21/06/2019 **Localizing Fast Radio Bursts and unveiling their extreme environments**, *B. Marcote*, [Seminar](#) at DESY, Berlin, Germany.
- 10/06/2019 **SKA as a machine to localize Fast Radio Bursts**, *B. Marcote*, Contributed talk at the ¡España en SKA! Meeting, Granada, Spain.
- 26/03/2019 **Observing a Fast Radio Burst from radio wavelengths to very high energy gamma-rays**, *B. Marcote*, Contributed talk at The New-Era of Multi-Messenger Astrophysics Symposium, Groningen, The Netherlands.
- 20/02/2019 **The fading of a possible long gamma-ray burst in a fast radio burst-like environment**, *B. Marcote*, Contributed talk at the Fast radio bursts and their possible neutron star origins (FRB2019) Meeting, Amsterdam, The Netherlands.
- 30/01/2019 **Localizing Fast Radio Bursts and unveiling their extreme environments**, *B. Marcote*, Seminar at INAF OAS, Bologna, Spain.
- 08/10/2018 **The localization of a repeating Fast Radio Burst**, *B. Marcote*, [invited talk \(review\)](#) at the 14th EVN Symposium & Users Meeting, Granada, Spain.
- 04/10/2018 **Science with the European VLBI Network (EVN)**, *B. Marcote*, [invited talk](#) at the Instituto de Astrofísica de Andalucía (IAA), Granada, Spain.
- 04/09/2018 **Science with the European VLBI Network (EVN)**, *B. Marcote*, [invited talk](#) at the 48th Young European Radio Astronomers Conference (YERAC), Dwingeloo, The Netherlands.
- 18/07/2018 **Unveiling the origin of Fast Radio Bursts by localizing the only repeating source**, *B. Marcote*, contributed talk at the Spanish Astronomical Society (SEA) Conference, Salamanca, Spain.
- 15/05/2018 **The unique case of AR Scorpii, a radio-pulsing white dwarf / M star binary**, *B. Marcote*, contributed talk at the Netherlands Astronomers Conference (NAC), Groningen, The Netherlands.
- 02/03/2018 **Localizing a Fast Radio Burst and unveiling its extreme environment**, *B. Marcote*, [invited colloquium](#) at MPIfR, Bonn, Germany.
- 12/09/2017 **The first localization of a Fast Radio Burst and resulting high-energy implications**, *B. Marcote*, contributed talk at the High-Energy Phenomena in Relativistic Outflows VI Conference, Moscow, Russia.
- 05/07/2017 **AR Scorpii, a low-mass binary with the first known radio pulsar white dwarf**, *B. Marcote*, [invited talk](#) at the Variable Galactic Gamma-Ray Sources, Tokyo, Japan.
- 14/06/2017 **Multiwavelength emission of the gamma-ray binary LS I +61 303**, *B. Marcote*, [invited talk](#) at the Multifrequency Behavior of High Energy Cosmic Sources, Palermo, Italy.
- 31/05/2017 **Localizing a Fast Radio Burst for the first time**, *B. Marcote*, contributed talk at The Labyrinth of the Unexpected: unforeseen treasures in impossible regions of phase space, Kerastari, Greece.

- 27/04/2017 **Fast Radio Bursts and their possible emission at high energies**, *B. Marcote*, [invited talk](#) at MAGIC Physics Spring Meeting, CERN, Switzerland.
- 13/03/2017 **Localizing a Fast Radio Burst for the first time**, *B. Marcote*, talk at IFCA/UC, Santander, Spain.
- 06/02/2017 **Localizing a Fast Radio Burst for the first time**, *B. Marcote*, [invited talk](#) at the ICCUB Winter Meeting, Barcelona, Spain.
- 18/10/2016 **On the origin of Fast Radio Bursts and sub-millisecond localization**, *B. Marcote*, [invited talk](#) at the Departament de Física Quàntica i Astrofísica, University of Barcelona, Barcelona, Spain.
- 29/09/2016 **eEVN localization of millisecond transient signals**, *B. Marcote*, contributed talk at the NW3 Meeting, Nijmegen, The Netherlands.
- 22/09/2016 **Is FRB 150418 localized in WISE J0716-19? Clues from EVN observations**, *B. Marcote*, contributed talk at the 13th European VLBI Network Symposium, St. Petersburg, Russia.
- 14/07/2016 **Measuring the expansion velocity of the outflows of LS I +61 303 through low- frequency radio observations**, *B. Marcote*, contributed talk at the 6th International Symposium on High-Energy Gamma-Ray Astronomy (Gamma2016), Heidelberg, Germany.
- 07/10/2015 **Physical properties of the gamma-ray binary LS 5039 through low and high frequency radio observations**, *B. Marcote*, contributed talk at HEPRO V conference, La Plata, Argentina.
- 04/05/2015 **Absorption mechanisms in the gamma-ray binary LS 5039 from its full radio spectrum**, *B. Marcote*, [invited talk](#) at the Variable Galactic Gamma-ray Sources meeting, Heidelberg, Germany.
- 10/10/2014 **Discovering the Colliding Wind Binary HD 93129A**, *B. Marcote*, contributed talk at EVN Symposium, Cagliari, Italy.
- 08/07/2014 **Variable very-low frequency radio emission from the gamma-ray binary LS I +61 303**, *B. Marcote*, contributed talk at BeXRB 2014 meeting, Valencia, Spain.
- 10/12/2013 **The Low Frequency Emission for Gamma-Ray Binaries**, *B. Marcote*, contributed talk at The Metrewavelength Sky Conference, Pune, India.

## Lectures

- 19/10/2016 **The EVN Pipeline**, *ERIS School 2017*, ASTRON/JIVE, Dwingeloo, The Netherlands.

## Outreach Talks

- 18/01/2020 **Lo que sabemos de los FRB**, *Principio de Incertidumbre – Canal Extremadura*, Interview in a local radio program from Spain.
- 12/08/2013 **El cielo menos conocido... de radio a rayos gamma**, *AstroSantander*, Centro Cultural Dr. Madrazo, Santander, Spain.

## Scientific Posters

- July 2016 **The origin of Fast Radio Bursts, still an open question**, *B. Marcote, M. Giroletti, M. Garrett, Z. Paragi, J. Yuang, K. Hada, C. C. Cheung*, Spanish Astronomical Society (SEA) Meeting, Bilbao, Spain.
- October 2015 **Orbital and superorbital variability of LS I +61 303 at low radio frequencies with GMRT and LOFAR**, *B. Marcote, M. Ribó, J. M. Paredes, C. H. Ishwara-Chandra, J. D. Swinbank, J. W. Broderick, S. Markoff, R. Fender, R. A. M. J. Wijers, G. G. Pooley, A. J. Stewart, M. E. Bell, R. P. Breton, D. Carbone, S. Corbel, J. Eislöffel, H. Falcke, J.-M. Grießmeier, M. Kuniyoshi, M. Pietka, A. Rowlinson, M. Serylak, A. J. van der Horst, J. van Leeuwen, M. W. Wise, P. Zarka*, HEPRO V, La Plata, Argentina.
- October 2014 **The changing morphology of the radio outflow of HESS J0632+057 along its orbit**, *B. Marcote, J. Moldón, M. Ribó, J. M. Paredes, Z. Paragi*, EVN Symposium, Cagliari, Italy.

- April 2013 **First LOFAR Observations of Gamma-Ray Binaries**, *B. Marcote, M. Ribó, J. M. Paredes, J. Swinbank, J. Broderick, R. Fender, S. Markoff, R. Wijers*, The Modern Radio Universe 2013, Bonn, Germany.
- July 2012 **First LOFAR Observations of Gamma-Ray Binaries**, *B. Marcote, M. Ribó, J. M. Paredes, J. Swinbank, J. Broderick, R. Fender, S. Markoff, R. Wijers*, 2012 Heidelberg International Symposium on High Energy Gamma-Ray Astronomy, Heidelberg, Germany.

## Outreach Publications

- 08/2017 **First light of the JIVE UniBoard Correlator**, *Benito Marcote on behalf of the JIVE Uniboard Correlator Team*, ASTRON News, Summer 2017, p. 8.
- 08/2017 **FRB 121102: A long time ago in a galaxy far-far away**, *J. Hessels, B. Adams, C. G. Bassa, A. Keimpema, H. J. van Langevelde, N. Maddox, Benito Marcote, Z. Paragi*, ASTRON News, Summer 2017, p. 12–13.

## Research Stays

- 09–10/2014 **FPI stay at JIVE**, *Joint Institute for VLBI in Europe*, Dwingeloo, The Netherlands.  
Learning on VLBI reduction techniques with EVN experts  
SUPERVISOR: Zsolt Paragi  
DURATION: 64 days
- 08–10/2013 **FPI stay at API/UvA**, *Anton Pannekoek Institute*, Amsterdam, The Netherlands.  
Collaboration with the Transients Key Science Group of LOFAR  
SUPERVISOR: John Swinbank  
DURATION: 62 days
- 08–09/2012 **Stay at the NCRA**, *National Centre for Radio Astrophysics*, Pune, India.  
Learn the analysis of GMRT radio observations  
SUPERVISOR: C. H. Ishwara-Chandra  
DURATION: 16 days
- 01–03/2012 **FPI stay at API/UvA**, *Anton Pannekoek Institute*, Amsterdam, The Netherlands.  
Collaboration with Transients Key Science Group of LOFAR and theoretical group  
SUPERVISORS: Sera Markoff  
DURATION: 62 days

## Teaching Activities

- May 2019 **Co-trainer of the ASTRON/JIVE Traineeships in Science Operations with Massive Arrays Programme**, *1 week*.  
Training of four students on EVN operations and VLBI analysis.
- Summer 2018 **Co-supervisor in the ASTRON/JIVE Summer Student Programme**, *2 months*.  
The student Alexander Plavin worked on *A repeating fast radio burst and its persistent radio counterpart*.
- Summer 2016 **Co-supervisor in the ASTRON/JIVE Summer Student Programme**, *2 months*.  
The student Yuping Huang worked on *localizing fast transients with VLBI*.
- Spring 2015 **Fundaments of laboratory (Physics Laboratory)**, *36 hr*, laboratory and PC sessions.  
Physics Degree, 1st course, University of Barcelona
- Fall 2014 **Astronomía (astronomy)**, *24 hr*, observational sessions.  
Physics Degree, 2nd course, University of Barcelona
- Spring 2014 **Fonaments de Laboratori (Physics Laboratory)**, *30 hr*, laboratory and PC sessions.  
Physics Degree, 1st course, University of Barcelona
- Spring 2014 **Astronomía (astronomy)**, *8 hr*, observational sessions.  
Physics Degree, 2nd course, University of Barcelona
- Fall 2013 **Astronomía (astronomy)**, *8 hr*, observational sessions.  
Physics Degree, 2nd course, University of Barcelona

## Observing Activities

- March–April 2015 **Shift at the MAGIC Telescopes**, 3 weeks, Shift Leader role.  
MAGIC (Observatory of Roque de los Muchachos), La Palma, Spain.
- June 2014 **Shift at the MAGIC Telescopes**, 3 weeks, Shift Leader role.  
MAGIC (Observatory of Roque de los Muchachos), La Palma, Spain.
- June 2013 **Shift at the MAGIC Telescopes**, 4 weeks, Operator role.  
MAGIC (Observatory of Roque de los Muchachos), La Palma, Spain.

## Additional Information

- Referee of journals like MNRAS or Science Bulletin and proposals from e-MERLIN.
- 2018– **Junior member of the International Astronomical Union (IAU).**
- 2018–2020 **TAC Reader of the Australia Telescope National Facility (ATNF).**
- 2018–2019 **Member of the RadioAstron Program Evaluation Committee (RPEC)**, for the 6th and 7th Announcements of Opportunity (January 2018/2019).
- 2016–2017 **Co-organizer of colloquia at the ASTRON/JIVE institute.**
- 2014– **Member of the Spanish Astronomical Society (SEA).**
- 2014 **Online course: Introduction to Computational Thinking and Data Science**, edX-MITx, Honor Code Certificate, 9 weeks/15 hr.
- 2011–2015 **Member of the MAGIC Collaboration.**
- 2009–2012 **Member of AstroSantander**, association of amateur astronomers, Santander, Spain.
- 2004–2009 **Member of Agrupación Astronómica Cántabra**, association of amateur astronomers, Santander, Spain.
- 2006 **XVII Congreso Estatal de Astronomía**, national meeting of amateur astronomers, participant and local organizing committee, Santander, Spain.