

# Victor Barbosa Martins

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## Curriculum Vitae

I am a Physics Engineer (BSc) with a Master's and a PhD degree in Physics. I am currently a Postdoctoral researcher at DESY. I have research experience in the field of Astroparticle Physics, in particular with instrumentation for gamma-rays experiments and with extra-galactic gamma-ray astrophysics (data analysis and interpretation). I have developed the software for the structure condition monitoring of the medium-sized telescope of CTA and develop now simtools, the simulation pipeline for CTA, both in Python. In the current position, I familiarized myself with the CORSIKA and Sim\_telarray softwares. My current scientific interests lie mainly on extragalactic gamma-ray astronomy, especially blazars and radio galaxies, galaxy cluster, and on multimessenger astronomy. I am currently a member of the CTA Consortium and H.E.S.S. Collaboration.

## Personal Information

Full Name Victor Barbosa Martins  
Date of Birth February, 18th, 1991  
Place of Birth Sacramento-MG, Brazil

## Education

2018 – 2022 **PhD degree in Experimental Physics**  
Humboldt-Universität zu Berlin, Germany.  
2016 – 2018 **Master's degree in Applied Physics**  
São Carlos Institute of Physics, University of São Paulo (USP), Brazil.  
2009 – 2014 **Bachelor's degree in Engineering Physics**  
Federal University of São Carlos (UFSCar), Brazil.

## Work Experience

07/2022 – **Research assistant - Postdoctoral researcher**, *Deutsches Elektronen-Synchrotron (DESY), Zeuthen, Germany*  
Leader: Dr. Gernot Maier.  
09/2018 – **Research assistant - PhD candidate**, *Deutsches Elektronen-Synchrotron (DESY), Zeuthen, Germany*  
06/2022  
Leaders: Prof. Dr. David Berge, Dr. Markus Garzarczyk, and Dr. Stefan Ohm.  
09/2016 – **Technical development analyst**, *National Synchrotron Light Source (LNLS), 01/2018*  
*National Center for Research in Material and Energy (CNPEM), Campinas – SP, Brazil*

Leader: Dr. Narcizo de Souza

01/2014 – **System analyst**, Itaú Unibanco (*bank*), São Paulo, Brazil  
06/2014

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## Research projects

- 09/2018 – **“Probing the propagation of cosmic rays in the Virgo Cluster with  
06/2022 H.E.S.S.”**, *PhD project - science*, Deutsches Elektronen-Synchrotron (DESY),  
Zeuthen, Germany  
Supervision: Prof. Dr. David Berge and Dr. Stefan Ohm
- 09/2018 – **“A monitoring system for the Medium-Sized Telescope (MST) of  
06/2022 Cherenkov Telescope Array (CTA)”**, *PhD project - technical task*, Deutsches  
Elektronen-Synchrotron (DESY), Zeuthen, Germany  
Supervision: Prof. Dr. David Berge and Dr. Markus Garczarczyk
- 02/2016 – **“Resistive plate chambers design, development and tests for the Pierre  
08/2018 Auger Observatory”**, *Master’s project*, São Carlos Institute of Physics (IFSC-  
USP), Brazil  
Supervision: Prof. Dr. Vitor de Souza  
Scholarship: National Council for Scientific and Technological Development
- 08/2013 – **“Characterization of Bragg Gratings in microstructured multicore  
12/2013 optical fiber”**, *Internship*, IPHT Leibniz-Institut für Photonische Technologien,  
Jena, Germany  
Supervision: Dr. Martin Becker  
Scholarship: Science without borders
- 08/2010 – **“Configuration of Cherenkov Telescopes for particle astrophysics”**,  
08/2012 *Undergraduate research*, São Carlos Institute of Physics (IFSC-USP), Brazil  
Supervision: Prof. Dr. Vitor de Souza  
Scholarship: National Council for Scientific and Technological Development
- 03/2009 – **“Pan-Starss and Killer Asteroid Projects”**, *group member*, Astronomy  
12/2011 group, Federal University of São Carlos (UFSCar), Brazil  
Leader: Prof. Dr. Gustavo Rojas

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## Selected Publications

### Journal papers

- in internal review* (**corresponding author**) EHT Collaboration, HESS Collaboration, VERITAS  
Collaboration, MAGIC Collaboration, Fermi Collaboration, EAVN Collaboration,  
“Broadband Multi-wavelength Properties of M87 during the 2018 EHT Campaign  
and a Very High Energy Flaring Episode”.
- in internal review* (**first author**) HESS Collaboration, “The spectrum of the VHE gamma-ray high  
state of M87”.
- 2023 (**first author**) HESS Collaboration, “Constraining the cosmic-ray pressure in the  
inner Virgo Cluster using H.E.S.S. observations of M87”, *A&A*, 675, A138, 2023.
- 2018 (**corresponding author**) P. Abreu et al., “MARTA: a high-energy cosmic-ray  
detector concept for high-accuracy muon measurement”, *EPJC*, 78, 333, 2018.

## Proceedings and conference presentations

- 2023 (**poster**) Rahul Cecil, V. Barbosa Martins, Iryna Lypova et al. (H.E.S.S. Collaboration), “Probing Gamma-Ray Propagation at Very-High Energies with H.E.S.S. Observations of M87”, [PoS\(ICRC2023\)908](#), 2023.
- 2023 (**poster**) V. Barbosa Martins (H.E.S.S. Collaboration), “Probing the morphology of the low state gamma-ray emission of M87 with H.E.S.S.”, [PoS\(ICRC2023\)696](#), 2023.
- 2022 (**poster**) P. Zilberman, V. Barbosa Martins, I. Lypova, et al. (H.E.S.S. Collaboration), “Constraining the Extragalactic Background Light using H.E.S.S. Observations of M87”, 7th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy ( [\$\gamma\$ -2022](#)), 2022.
- 2022 (**talk**) V. Barbosa Martins (H.E.S.S. Collaboration), “The gamma-ray morphology of M87 and the cosmic-ray pressure in the Virgo Cluster with H.E.S.S.”, 7th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy ( [\$\gamma\$ -2022](#)), 2022.
- 2020 (**poster**) V. Barbosa Martins and M. Garczarczyk (CTA Consortium), “The structure monitoring of the MST prototype of CTA”, [Proc. SPIE](#), 11445, 114456E, 2020.
- 2019 (**poster**) V. Barbosa Martins et al. (CTA Consortium), “A Condition Monitoring Concept Studied at the MST Prototype for the Cherenkov Telescope Array”, [PoS\(ICRC2019\)626](#), 2019.

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## Teaching Experience

### Teaching assistant at Humboldt-Universität zu Berlin

- 2019 **Extragalactic astronomy**, *Undergraduate course*  
Assistant to Prof. Dr. David Berge and Prof. Dr. Marek Kowalski.

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## Supervision

- 2023 **Summer school project, DESY, Zeuthen, Germany**, *Science verification of CTA: the construction phase and the monitoring arrays.*  
Student: Julia Lagunas Miralles
- 2023 **Ukraine winter school project, DESY, Zeuthen, Germany**, *The effect of the atmospheric composition on CTA performance.*  
Student: Kateryna Solovian
- 2022 **Summer school project, DESY, Zeuthen, Germany**, *Event-type Analysis for CTA.*  
Student: Evgenia Kennedy

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## Organisation

- 12/2022 – **Astroparticle Physics Seminar, DESY, Zeuthen, Germany**  
Weekly seminar co-organized for the Astroparticle Division at DESY.

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## Software development

- 07/2022 – **simtools**, *Simulation tools and applications for CTA*

09/2018 – **MST health monitoring system**, *Health monitoring system for the MST*  
06/2022 *structure of CTA*)

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## Languages

Native	Brazilian Portuguese
Fluent	English and German
Intermediate	Spanish
Basic	Polish

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## Skills

Programming languages	Advanced level: Python (e.g. Numpy, Scipy, Matplotlib, Pandas, Astropy, Gammapy, Gamera, Naima); Intermediate level: LaTeX, bash, C, C++
Software	Advanced level: Pycharm (IDE for python), Artemis Modal Pro (vibration measurements), Autodesk Inventor (mechanical drawing); Intermediate level: CORSIKA (simulation of atmospheric shower), Sim_telarray (simulation of the detection of atmospheric showers by Cherenkov telescopes), Zemax (optical ray tracing)
Tools	Github, Notion, Mendeley.
Soft skills	Organized, good time and project management skills, good listener, contribute to a healthy work atmosphere.

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## References

### **Dr. Gernot Maier**

Deutsches Elektronen-Synchrotron (DESY)  
Zeuthen, Germany  
E-mail: gernot.maier at desy.de

### **Prof. Dr. David Berge**

Deutsches Elektronen-Synchrotron (DESY) and Humboldt-Universität zu Berlin  
Zeuthen, Germany  
E-mail: david.berge at desy.de

### **Dr. Stefan Ohm**

Deutsches Elektronen-Synchrotron (DESY)  
Zeuthen, Germany  
E-mail: stefan.ohm at desy.de

### **Dr. Markus Garczarczyk**

Deutsches Elektronen-Synchrotron (DESY)  
Zeuthen, Germany  
E-mail: markus.garczarczyk at desy.de

### **Prof. Dr. Vitor de Souza**

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