

# Sara Buson

## Curriculum Vitae

Institut für Theor. Physik und Astrophysik  
Universität Würzburg, Emil-Fischer-Str. 31  
97074 Würzburg, Germany  
☎ (+49) 931 31-82449  
✉ sara.buson@astro.uni-wuerzburg.de  
🌐 www.sarabuson.com

### Current Position

08.2018 – **Junior Professor**, *Institut für Theoretische Physik und Astrophysik, by the Chair for Astronomy at Universität Würzburg, Würzburg, DE*

My research interests include high-energy astrophysics and multi-messenger astrophysics. In particular, my research group focuses on studies of active galactic nuclei, blazar variability, multi-messenger follow-up of transient and variable sources, electromagnetic counterparts of cosmic neutrino sources.

### Appointments

- 12.2018 – **Visiting Assistant Research Scientist**, *University of Maryland, Baltimore County, MD, USA*,  
12.2019 Collaboration with NASA-GSFC in perspective of future high-energy multimessenger space missions (such as AMEGO), see e.g., White Paper for Astro2020: Santander, Buson et al (2019 BAAS, 51, 228) "A Unique Messenger to Probe Active Galactic Nuclei: High-Energy Neutrinos" - link
- 05.2016 – **NASA Postdoctoral Fellowship**, *based at NASA Goddard Space Flight Center (GSFC), Greenbelt, MD, USA*, study of flaring blazars, gamma-ray transients within gravitational waves and neutrinos searches
- 06.2015 – **Post-Doctoral Research Associate**, *NASA/GSFC, Center for Space Science and Technology*,  
04.2016 *University of Maryland, Baltimore County, Greenbelt, MD, USA*, study of  $\gamma$ -ray blazar spectra and variability, transients within gravitational waves and neutrinos searches; novae at  $\gamma$ -rays
- 03.2013 – **Assegnista di Ricerca**, (*Post-Doc*) *Univ. of Padova, INFN and INAF Research Affiliate*, Flaring  
02.2015 blazars, especially study of gravitationally lensed blazars at gamma-rays. Collaboration with several major multiwavelength teams (Veritas, MAGIC, Torla, OVRO among others)

### Abilitazione Scientifica (Italian habilitation)

Abilitazione scientifica nazionale per il settore 02/A1 per Seconda Fascia (Physics, valid up to 05/10/2024).

Abilitazione scientifica nazionale per il settore 02/C1 per Seconda Fascia (Astronomy, valid up to 11/07/2024).

### Education

- 04.2013 **Physics PhD degree**, *Title: The TeV AGN Portfolio: extending Fermi-LAT analysis into the CTA realm*, Supervisors: D. Bastieri, Univ. of Padova (IT) & Prof. G. Madejski, Univ. Stanford (USA), topics: Blazars at  $\gamma$ -rays in perspective of the upcoming CTA; gamma-ray transient searches, flaring blazars at multiwavelengths
- 2013 **Visiting collaborator at Berkeley Space Sciences Laboratory**, project topic included investigation of AGN in context of extragalactic background light (one month, supervisor: Dr. M. Ajello)
- 2012 **Visiting scholar at Stanford University**, project topic included investigation of the peculiar blazar "neutrino candidate" PKS 1424-418 (one month, supervisor: Prof. G. Madejski)

2009 **Master degree in Physics**, *Title: Observation of VHE Blazars with the Fermi-LAT Telescope*, University of Padova, Supervisors: Prof. D. Bastieri & Dr S. Carrigan

## Honors and Awards

- 20.04.2021 **Officer of the Order of Merit of the Italian Republic**, bestowed by the President of the Italian Republic  
Ufficiale dell' *Ordine al merito della Repubblica Italiana*, onoreficenza conferita dal Presidente della Repubblica Italiana.
- 23.10.2018 **ISSNAF Award for Young Investigators (astrophysics)**, competitive award (3k\$) conferred at the Italian embassy in Washington (DC, USA) to acknowledge the research of Italian young investigators, whose commitment to their discipline of study is innovative and high-impact (by Italian Scientists and Scholars in North America Foundation)
- 2015 **NASA Postdoctoral Fellowship (NPP)**, competitive appointment (120k\$) awarded by NASA/Goddard Space Flight Center (MD, USA)
- 27.12.2018 **Attestato di Benemerenzza**, conferred by the Major of Pernumia (PD, IT), to acknowledge the outstanding contribution to the astrophysics field  
"per i Meriti Accademici e Scientifici, che nel tributarle gli Onori della Comunità Internazionale danno lustro alla Nazione".

## Managerial Responsibilities

### Coordination Experience

- 08.2019 – **Reviewing Editor for Journal Experimental Results**, *Physics and Astronomy*, Cambridge Univ. Press (ISSN: 2516-712X), (see this link)
- 03.2019 – **Coordinator: Fermi-LAT AGN scientific group**, (> 170 members). Upon being appointed, since this duty could have conflicted with my major commitment on the time-domain task (below), with the *Fermi* collaboration we decided to let my contribution be at the supporting level for the time-domain group
- 03.2016–03.2019 **Convener: Fermi-LAT Flare Advocate group**, (~ 30 members), Immediate aims: real-time time-domain study, multi-messenger follow up (neutrinos) observations.  
Detailed achievements: Coordination of multi-wavelength observations with major current facilities in the context of follow-up publications. Space-based telescopes: *Fermi*-LAT, Swift-XRT/UVOT. Ground-based telescopes: MAGIC, VERITAS, HESS and FACT, HAWC. Neutrino observatories: IceCube, Antares. More than 60 Astronomer's Telegram and Global Circular Network (GCN) issued as leader and co-leader, among which  $\gamma$ -ray follow-up observations of IceCube neutrino alerts

## Organisation Responsibilities

- 2016/2018 **Board member of the NASA Post-Doc Association**, at NASA-GSFC
- 2016/2018 **Organiser of the "Fermi Journal Club"**, at NASA-GSFC  
**Conference Organisation - selected, major international (attendees 50 – 300)**
- 2020 **Convener of the 37th International Cosmic Ray Conference (ICRC)**, SOC & LOC member, topic "Space-based Gamma-ray Astronomy", dates: upcoming July 2021, Berlin (DE)
- 2018 **Convener of the TeV Particle Astrophysics (TeVPA) conference**, SOC member for the topic "Gamma-ray Astronomy", dates: 27/31-08-2018
- 2018 **Organiser of the TeVPA pre-workshop on neutrinos and gamma-rays from AGN**, SOC member, DESY/Zeuthen, Berlin, DE, dates: 26-08-2018

- 2018 **Organiser of the 8th *Fermi* Symposium**, LOC member, Baltimore, MD, USA, dates: 14/19-10-2018
- 2017 **Organiser of the 4th *Fermi*-VERITAS-HAWC Workshop**, SOC member, UMD University, 10/11-03-2017
- 2016 **Organiser of the 3rd *Fermi*-VERITAS-HAWC Workshop**, SOC member, Utah University, dates: 20/21-04-2016
- 2015 **Organiser of the 6th *Fermi* Symposium**, LOC member, Washington, DC, USA, dates: 9/13-11-2015
- 2015 **Organiser of the Workshop Cosmic Rays - Beyond The Standard Model**, LOC member, San Vito di Cadore, Italy, 16/22-03-2014
- 2012 **Organiser of the *Fermi*-LAT collaboration meeting**, LOC member, Padova, Italy, dates: 5/9-03-2012

## Professional Experience

Active Member of the following teams:

- 2008– Present **Member of the *Fermi*-LAT Collaboration**
- 2018– 2020 **Member of the Zwicky Transient Facility (ZTF) team**, a time-domain survey in the optical energy range
- 2014– 2018 **Member of The Major Atmospheric Gamma ray Imaging Cherenkov Telescope (MAGIC) Collaboration**
- 2016– Present **Member of the All-sky Medium Energy Gamma-ray Observatory (AMEGO) Team**, next-generation wide-aperture discovery mission for high-energy astrophysics led by NASA/GSFC (PI: McEnery)
- 2017– 2019 **Member of the ASTROGAM team**, breakthrough Observatory space mission, similar to AMEGO, that was proposed to the European Space Agency (PI: De Angelis)

and of the following scientific societies:

- 2015– 2019 **Member of the American Astronomical Society (AAS)**
- 2014– present **Member of the International Astronomical Union (IAU)**

## Competitive Scientific Proposals // Self-Raised Funds (> 2M€)

- As **Principal Investigator (PI)** of the telescope-time request / project: including the management of the grant, coordination of the scientific activities and researchers involved.
- 2022 **DFG Research Unit ("Forschungsgruppen")**, "*Relativistic jets in Active Galactic Nuclei*", co-applicant and PI of a project, ~200k€
- 2020 **ERC Starting Grant**, *MessMapp: Mapping Highly-Energetic Messengers throughout the Universe*, ~1.5M€
- 2020 **Fermi GI-13**, *Enabling Prompt identifications of electromagnetic counterparts to high-energy neutrinos with Fermi-LAT*, Scientific PI, ~70k\$
- 2019 **JMU Wuerzburg Start-up Funding**, *Variability of blazars*, 20k€ (Univ. Würzburg)
- 2019 **Bavarian Funding (BayIntAnt)**, *High-Energy transients*, 2k€ (Univ. Würzburg)
- 2020 **Swift GI-19**, *Cycle 16, Follow up of neutrino source candidates*, Scientific PI, 60k\$

- 2020 **Follow up of a gravitationally lensed, flaring  $\gamma$ -ray blazar**, *Chandra Director's Discretionary Time* (2 DDT), Swift-XRT/UVOT (ToOs, 3-month monitoring campaign), ATCA (DDT, radio, 2-month monitoring), VLBA (monitoring)
- 2019 **INTEGRAL AO-17**, *Digging into the high-energy Transient and Variable Mine*, 300 ksec
- 2018 **XMM-Newton GO**, *Best-Bet Cosmic Neutrino Candidates*, 83 ksec
- 2018 **Fermi GI-11**, *Bridging the gap in the census of  $\gamma$ -ray variable sources*, 60k\$
- 2017 **Fermi GI-10**, *Intrinsic absorption in FSRQs: probing  $\gamma$ -ray emission sites in blazar jets*, 60k\$
- 2016 **NASA NPP Fellowship**, *Pinpointing Fingerprints in the Flat Spectrum Radio Quasars  $\gamma$ -ray spectra*, 120 k\$
- 2014 **Fermi-LAT ToO**,  *$\gamma$ -ray follow-up observations of flaring gravitationally lensed blazar*
- 2013 **Swift GI**, *Cycle 10, Investigating the anomalous behavior of extreme blazars*, Scientific PI, 45 k\$  
— As co-I of the project: including the coordination of the scientific activities.
- 2020 **Fermi GI-13**, *The first  $> 5\sigma$  detection of periodicities in blazars*,  $\sim 70k\$$
- 2012/2013 **Swift GI**, *Cycle 9 and 10, Fermi-LAT initiated ToO's for bright flaring  $\gamma$ -ray blazars*, co-I, 23k\$; 23k\$

### Invited Plenary Talks at International Conferences (selected, total: >20)

- 1) Low-latency alerts & Data analysis for MMA Workshop, Paris (FR, virtual); Invited talk on: "Mapping Highly Energetic Messengers throughout the Universe"; dates: 22-03-2022
- 2) DPG-Frühjahrstagung, Heidelberg (DE, virtual); Invited talk on: "Fermi-LAT multi-messenger follow up, focus on high-energy neutrinos & AGN"; dates: 13-01-2022
- 3) Jets 2021, Extragalactic jets on all scales - launching, propagation, termination, Heidelberg (DE, virtual); Invited talk on: "High-energy view of jetted active galaxies"; dates: 14/18-06-2021
- 4) 43rd COSPAR Scientific Assembly, session: E1.17: The Space View of Radio Galaxies, Sydney (AU); dates: 28-01/04-02-2021
- 5) 43rd COSPAR Scientific Assembly, session: E1.6: X- and Gamma-ray Counterparts of New Transients in the Multimessenger Era, Sydney (AU); dates: 28-01/04-02-2021
- 6) Town Hall KM3NeT Meeting: Invited talk on *Fermi-LAT: an ideal partner for neutrino observatories*, dates: 17/19-12-2019
- 7) PAHEN Meeting: Invited talk on *High-energy neutrinos from AGNs? (the case of TXS 0506+056/IC170922A)*, dates: 25-27-09-2019
- 8) 12th INTEGRAL Conference, 1st AHEAD Gamma-ray Workshop, Geneve (SW): Invited talk on *Linking Electromagnetic Observations to Neutrino Astrophysics*, dates: 11/15-02-2019
- 9) TeV Particle Astrophysics (TeVPA) conference, Berlin (DE): Invited talk on *Hunting neutrino sources with the Fermi-Large Area Telescope*, dates: 27/31-08-2018
- 10) High Energy Astrophysics in Southern Africa conference (HEASA), Free State (South Africa): Invited talk on *Cosmic Synergies between Gamma rays and Neutrinos*, dates: 1/3-08-2018
- 11) 15th Marcell Grossman Conference, Rome (IT): Invited talk on *Neutrinos and gamma-rays from blazars*, dates: 1/7-07-2018
- 12) Vulcano Workshop, Vulcano (IT): Invited talk on *Flaring gamma-ray AGNs*, dates: 20/26-05-2018

- 13) AGILE Symposium, Rome (IT): Invited talk on *Short-Timescale Variability of Gamma-ray Blazars Detected by Fermi*, dates: 11/13-12-2017
- 14) ShanghaiTech Summer School, Asiago (IT): Invited talk on *The Dawn of the Multi-Messenger Astronomy: Exploring the Extreme Universe with Cosmic Messengers*, dates: 17-08 / 06-09-2017
- 15) Workshop on Perspectives on the Extragalactic Frontier, ICTP Trieste (IT): Invited talk on *Fermi, an Ideal Partner for Gravitational Waves Observatories*, dates: 2/6-05-2016
- 16) The Future of Research on Cosmic Gamma Rays, La Palma, Canary Islands (ES): Invited review on *Fermi Highlights and Perspectives*, dates: 26/29-08-2015
- 17) Mondello Workshop, Palermo (IT): Invited review on *The Extragalactic Background Light: the emission from all stars and black holes*, dates: 26/31-05-2014
- 18) 10th SciNeGHE Workshop, Lisbon (PT): Invited talk on *Gamma Ghosts and Gravitational Lensing*, dates: 4/6-06-2014
- 19) Vulcano Workshop, Vulcano (IT): Invited talk on *Flaring gamma-ray AGNs*, dates: 18/24-05-2014
- 20) Les Rencontres de Physique de la Vallee d'Aoste, La Thuile (IT): Invited review on *An extreme point of view: the Fermi gamma-ray sky*, dates: 23-02 / 01-03-2014
- 21) The Roma International Conference on Astroparticle Physics, Rome (IT): Invited talk on *Fermi-LAT recent results on AGNs*, dates: 21/24-05-2013
- 22) GAMMA 400 Workshop, Trieste (IT): Invited talk *Fermi-LAT extragalactic gamma-ray highlights*, dates: 2/4-05-2013

Note: a full CV may be provided upon request.