SAPTASHWA BHATTACHARYYA

Address: 1-48-6, Otsuka, Tokyo 170-0005, Japan

(+81)9065348596 ⋄ saptas20@gmail.com

EDUCATION

PhD, High Energy Astrophysics *October 2013 - April 2019*
Waseda University, Tokyo

Supervisor: Dr. Shoji Torii, P.I. of CALET
Co-Supervisors: Dr. Holger Motz, Dr. Yoichi Asaoka.

Thesis: *Search for Signals of Decaying Dark Matter and Spectral Features in the Flux of Electron and Positron Cosmic-Rays Measured with CALET on the ISS.*

Experience: Worked in the Science and Analysis team of CALET project. GeV-TeV Cosmic-ray propagation in Milky-Way galaxy with numerical simulation tool GALPROP. Finding Dark Matter and Nearby Pulsar Signature in Cosmic-ray $e^+ + e^-$ spectrum measured by CALET and predicting future observations.

M.Sc., Physics *May 2011 - April 2013*
IIT Hyderabad, India CGPA: 9.20

Specialization: Particle Physics, Quantum Field Theory

Supervisor: Dr. Narendra Sahu
Thesis: *Relic Abundance of Inert Fermion Doublet Dark Matter.*

B.Sc., Physics *May 2008 - April 2011*
Calcutta University, India 1st Class Hons.
Specialization: Special Theory of Relativity

High School Graduation *March 2008*

93% in Mathematics, Physics, Chemistry

AWARDS AND SCHOLARSHIPS

- Awarded full 5-year PhD Fellowship by Japan International Cooperation Agency.

- Received IIT Gold Medal in 2013, as the best student of Physics Department.

- Awarded Ministry of Human Resources Scholarship by Indian Government from 2009-2013.

- Awarded Sashank-Sekhar Memorial Prize in 2009 by Scottish Church College, for best student in Physics Department.

TECHNICAL STRENGTHS

Data Analysis and Machine Learning   Python, Pandas, Scikit-Learn, TensorFlow, Keras

High Energy Physics   GALPROP, micrOMEGAs, PPPC4DMID

Others   Latex, Jupyter Notebook, Adobe Lightroom

WORK EXPERIENCE

Deep Learning Research Intern, Incubit Inc.   February 2019 - October 2019
Computer Vision and Semantic Segmentation using `TensorFlow, Keras`.

Visiting Researcher, RIKEN, ABBL Lab.   June-2019 - Present
CR Propagation near Galactic Center and γ-ray production in the Central Molecular Zone.

Teaching Assistant, Waseda University.   May 2014 - June 2018
Guiding masters students with GALPROP and checking/correcting presentations.

LEARNING *MACHINE LEARNING*

Received Data Science Professional Certificate, issued by *IBM* on April 2019.

Received Deep Learning Specialization Certificate, issued by *deeplearning.ai* on July 2019.

Received TensorFlow Specialization Certificate, issued by *deeplearning.ai* on November 2019.

Contributing Machine Learning and Data Science articles for Towards Data Science.

EXTRA-CURRICULAR ACTIVITIES

- Captained JICA International Football Team in between 2014-2017.
- Member of the Cepheid Astronomy Club, IIT Hyderabad.
- Volunteer activities to teach high school students mathematics and physics during summer camps in IIT Hyderabad.

REFERENCES

Dr. Shoji Torii - PhD Supervisor Waseda University.

Dr. Holger Motz and Dr. Yoichi Asaoka - Co-Supervisors for PhD.

Dr. Narendra Sahu - Master thesis supervisor, IIT Hyderabad.

Dr. Shigehiro Nagataki - Astrophysical Big Bang Laboratory, RIKEN.

GITHUB AND LINKEDIN

Github Profile.
LinkedIn Profile.

PUBLICATIONS AND PRESENTATIONS (ASTROPHYSICS)

Referred Journal Papers:

- *"An Interpretation of the Cosmic-Ray Electron + Positron Spectrum from 10 GeV to 3 TeV Measured by CALET on the ISS,"* **International Journal of Modern Physics D; IJMPD 1950035 (2019) no. 02**; [arXiv: 1712.06265]
  Saptashwa Bhattacharyya, Holger Motz, Yoichi Asaoka, Shoji Torii.

- *"Decaying Fermionic Dark Matter Search with CALET",* **Journal of Cosmology and Astroparticle Physics; JCAP 1708 (2017) no.08, 2012**; [arXiv: 1702.02546]
  Saptashwa Bhattacharyya, Holger Motz, Shoji Torii, Yoichi Asaoka.

- *"CALET's Sensitivity to Dark Matter Annihilation in the Galactic Halo",* **Journal of Cosmology and Astroparticle Physics; JCAP 1512 (2015) no.12, 047**; [arXiv: 1510.03168]
  Holger Motz, Yoichi Asaoka, Shoji Torii, Saptashwa Bhattacharyya.

Conference Proceedings:

- *"Searching for Cosmic-Ray Signals from Decaying Fermionic Dark Matter with CALET",* **Proceeding of Science; ICRC 2017, 919**;
  Saptashwa Bhattacharyya, Holger Motz, Shoji Torii, Yoichi Asaoka.

- *"Searching for Anisotropy in Electron + Positron Cosmic-Rays with CALET",* **Proceeding of Science; ICRC 2017, 265** ;
  Holger Motz, Yoichi Asaoka, Shoji Torii, Saptashwa Bhattacharyya.

- *"Self Consistent Simulation of Dark Matter and Background",* **Proceeding of Science; ICRC 2015, 1182** ;
  Saptashwa Bhattacharyya, Holger Motz, Shoji Torii, Yoichi Asaoka.

- *"CALET's Sensitivity to Dark Matter and Astrophysical Sources",* **Proceeding of Science; ICRC 2015, 1194** ;
  Holger Motz, Yoichi Asaoka, Shoji Torii, Saptashwa Bhattacharyya.

Oral and Poster Presentations:

- *"Searching for Decaying Fermionic Dark Matter with CALET",* Japan Physical Society, Presentation Id: 18aK21-5, Osaka University, March 2017;
  Saptashwa Bhattacharyya, Holger Motz, Shoji Torii, Yoichi Asaoka.

- *"Discerning Pulsar and Dark Matter Explanations of Positron Excess with CALET",* Japan Physical Society, Presentation Id: 19aAT-3, Tohoku Gakuin University, March 2016;
  Holger Motz, Yoichi Asaoka, Shoji Torii, Saptashwa Bhattacharyya.

- *"Self-Consistent Simulation of Cosmic-Ray Background Including Dark Matter Signatures",* Japan Physical Society, Presentation Id: 21pDC-10, Waseda University, March 2015;
  Saptashwa Bhattacharyya, Holger Motz, Shoji Torii, Yoichi Asaoka.

- *"CALET's Potential to Identify the Origin of the Cosmic-Ray Positron Excess",* Japan Physical Society, Presentation Id: 28aTS-2, Tokai University, March 2014;
  Holger Motz, Saptashwa Bhattacharyya, Shoji Torii, Tae Niita, Yoichi Asaoka, Yosui Akaike.