SAPTASHWA BHATTACHARYYA

Address: 1-48-6, Otsuka, Tokyo 170-0005, Japan
(+81)9065348596 ⋄ saptas20@gmail.com

EDUCATION

PhD, High Energy Astrophysics *10/2013 - 04/2019*
Waseda University, Tokyo

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

Experience: Worked in the Science and Analysis team of CALET project(developed by NASA, JAXA, ASI). GeV-TeV Cosmic-ray propagation in Milky-Way galaxy with numerical simulation tool GALPROP. Search for Dark Matter and Nearby Pulsar Signature in Cosmic-ray $e^+ + e^-$ data measured by CALET, predict possible future observations and find possibility to distinguish between astrophysical sources.

M.Sc., Physics *05/2011 - 04/2013*
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.*
Qualified GATE. All India Rank: 152.

B.Sc., Physics *05/2008 - 04/2011*
Calcutta University, India 1st Class Hons.
Specialization: Special Theory of Relativity.
Qualified JAM; All India Rank: 197.

High School Graduation *03/2008*

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.

GITHUB AND LINKEDIN

GitHub Profile.
LinkedIn Profile.

WORK EXPERIENCE

Deep Learning Research Intern, Incubit Inc. 02/2019 - 10/2019

- Semantic Segmentation using `TensorFlow, Keras`.
- Used U-Net for crack detection on roads, walls.
- Processing videos with OpenCV and used U-Net to identify rotten bean sprouts.
- Implemented DeepLabv3 (Atrous Convolution) on the same tasks for comparing results.
- Worked using pre-trained InceptionV3 and VGG16 model to inspect medical images and identify soft tissues.

Visiting Researcher, RIKEN, ABBL Lab. 07/2019 -
CR Propagation near Galactic Center and γ-ray production in the Central Molecular Zone.

Teaching Assistant, Waseda University. 05/2014 - 06/2018
Guiding masters students with GALPROP and checking/correcting presentations.

TECHNICAL STRENGTHS

Data Science, ML, DL	Python, NumPy, Pandas, Scikit-Learn, TensorFlow, Keras
High Energy Physics	GALPROP, micrOMEGAs, PPPC4DMID
Others	Latex, Jupyter Notebook, Adobe Lightroom

LEARNING *MACHINE LEARNING*

Independent Data Science Project: Opening a Lunch Restaurant in Tokyo, April 2019.

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 articles for **Towards Data Science**.

EXTRA-CURRICULAR ACTIVITIES

- Captained JICA International Football Team: 2014-2017.
- Volunteer to help specially-abled students with Hands on Tokyo: 2018-2020.

REFERENCES

Dr. Shoji Torii - PhD Supervisor Waseda University.

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

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

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:

- *"Interpretation of the CALET Electron+Positron Spectrum concerning Dark Matter Signatures",* **Proceeding of Science 2019, 358**;
  Holger Motz, Yoichi Asaoka, `Saptashwa Bhattacharyya`.
- *"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.