

# Achara Seripienlert, Ph.D.

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## Employment History

- 2020 – Present    **Postdoctoral Researcher.** National Astronomical Research Institute of Thailand (NARIT).  
**Supervisor:** Asst. Prof. Dr. Waraporn Nuntiyakul.  
**Field of research:** Cosmic rays, Monte-Carlo simulation using FLUKA, Portable neutron monitors (Changvan and Thimon), Neutron monitors, Neutrino (IceCube Collaboration), Space weather, Education and Outreach via Virtual Experience, Particle transport
- 2016 – 2020    **Data Analysis and Reporting Section Manager.** Dacon Inspection Technologies Co. Ltd. (Now is Dexon Technology PLC)  
**Experience in** In-line-inspection of pipelines report using metal loss techniques: ultrasonic compression wave (UT) and magnetic flux leakages (MFL). Caliper inspection. Mapping pipeline routes. ERF and Remaining life calculation. Implement relevant ASME codes, e.g., B31.3 and B31.4. Comparison of inspection data. Any information upon client requests.
- 2014 – 2016    **Lecturer.** Division of Physics, Faculty of Science and Technology, Rajamangkala University of Technology Thanyaburi.
- 2011 – 2014    **Postdoctoral Fellow.** Department of Physics, Faculty of Science, Mahidol University.  
**Supervisor:** Prof. Dr. David Ruffolo.  
**Field of research:** Turbulent magnetic field, Solar energetic particles, Simulations of magnetic field line and particle trajectory and Particle transport
- 2010 – 2011    **Software Engineer and Researcher.** Dacon Inspection Services, Co. Ltd.  
**Experience in** Non-Destructive Testing using Ultrasonic Testing (UT). Developing software using Delphi. On-site inspection.

## Education

- 2006 – 2010    **Ph.D. Physics, Mahidol University.**  
Dissertation title: *Local Trapping Boundaries and Dropouts of Solar Energetic Particles.*  
Advisor: Prof. Dr. David Ruffolo
- 2003 – 2006    **M.Sc. Physics, Mahidol University.**  
Thesis title: *Tracing Charged Particle Motion in a Turbulent Magnetic Field.*  
Advisor: Prof. Dr. David Ruffolo
- 1999 – 2003    **B.Sc. Physics, Thammasart University.**  
Project title: *Influence of Microcrystalline and Effect of Back Reflector Surface Roughness of Polycrystalline Silicon Thin Films.*  
Advisor: Asst. Prof. Seree Puttapat and Dr. Porponth Sichanugrist

## Research Publications

### Journal Articles

- 1 R. Chhiber, W. H. Matthaeus, C. M. S. Cohen, D. Ruffolo, W. Sonsrtee, P. Tooprakai, **A. Seripienlert**, P. Chuychai, A. V. Usmanov, M. L. Goldstein, D. J. McComas, R. A. Leske, J. R. Szalay, C. J. Joyce, A. C. Cummings, E. C. Roelof, E. R. Christian, R. A. Mewaldt, A. W. Labrador, J. Giacalone, N. A. Schwadron, D. G. Mitchell, M. E. Hill, M. E. Wiedenbeck, R. L. McNutt, and M. I. Desai. “Magnetic field line random walk and solar energetic particle path lengths. Stochastic theory and PSP/IS<sup>⊙</sup>IS observations”. In: *Astronomy and Astrophysics* 650, A26 (June 2021), A26. [DOI](#): 10.1051/0004-6361/202039816. arXiv: 2011.08329 [astro-ph.SR].
- 2 W. Mitthumsiri, **A. Seripienlert**, U. Tortempun, P. -S. Mangeard, A. Sáiz, D. Ruffolo, and R. Macatangay. “Modeling polar region atmospheric ionization induced by the giant solar storm on 20 January 2005”. In: *Journal of Geophysical Research (Space Physics)* 122.8 (Aug. 2017), pp. 7946–7955. [DOI](#): 10.1002/2017JA024125.
- 3 P. Tooprakai, **A. Seripienlert**, D. Ruffolo, P. Chuychai, and W. H. Matthaeus. “Simulations of Lateral Transport and Dropout Structure of Energetic Particles from Impulsive Solar Flares”. In: *Astrophysical Journal* 831.2, 195 (Nov. 2016), p. 195. [DOI](#): 10.3847/0004-637X/831/2/195.
- 4 D. Ruffolo, **A. Seripienlert**, P. Tooprakai, P. Chuychai, and W. H. Matthaeus. “Squeezing of Particle Distributions by Expanding Magnetic Turbulence and Space Weather Variability”. In: *Astrophysical Journal* 779.1, 74 (Dec. 2013), p. 74. [DOI](#): 10.1088/0004-637X/779/1/74.
- 5 M. C. Ghilea, D. Ruffolo, P. Chuychai, W. Sonsrtee, **A. Seripienlert**, and W. H. Matthaeus. “Magnetic Field Line Random Walk for Disturbed Flux Surfaces: Trapping Effects and Multiple Routes to Bohm Diffusion”. In: *Astrophysical Journal* 741.1, 16 (Nov. 2011), p. 16. [DOI](#): 10.1088/0004-637X/741/1/16.
- 6 **A. Seripienlert**, D. Ruffolo, W. H. Matthaeus, and P. Chuychai. “Dropouts in Solar Energetic Particles: Associated with Local Trapping Boundaries or Current Sheets?” In: *Astrophysical Journal* 711.2 (Mar. 2010), pp. 980–989. [DOI](#): 10.1088/0004-637X/711/2/980.

### Conference Proceedings

- 1 Alejandro Sáiz, Wirin Sonsrtee, Piyanate Chuychai, **Achara Seripienlert**, Pisan Tooprakai, David Ruffolo, William Matthaeus, and Rohit Chhiber. “Magnetic field line path length variations and effects on solar energetic particle transport”. In: *44th COSPAR Scientific Assembly. Held 16-24 July*. Vol. 44. July 2022, p. 1159.
- 2 Alejandro Sáiz, Ekawit Kittiya, Waraporn Nuntiyakul, **Achara Seripienlert**, Paul Evenson, David Ruffolo, and Suyeon Oh. “Cosmic ray flux correlation between McMurdo and Jang Bogo neutron monitor stations vs. time lag”. In: *44th COSPAR Scientific Assembly. Held 16-24 July*. Vol. 44. July 2022, p. 1054.
- 3 Paul Evenson, John Clem, Pierre-Simon Mangeard, Waraporn Nuntiyakul, David Ruffolo, Alejandro Sáiz, **Achara Seripienlert**, and Surujhdeo Seunarine. “Detecting Complex Interactions in a Neutron Monitor”. In: *44th COSPAR Scientific Assembly. Held 16-24 July*. Vol. 44. July 2022, p. 1049.
- 4 Pierre-Simon Mangeard, John Clem, Paul Evenson, Waraporn Nuntiyakul, David Ruffolo, Alejandro Sáiz, **Achara Seripienlert**, and Surujhdeo Seunarine. “Multiple interactions in a Neutron Monitor”. In: *EGU General Assembly Conference Abstracts*. EGU General Assembly Conference Abstracts. May 2022, EGU22-6352, EGU22-6352. [DOI](#): 10.5194/egusphere-egu22-6352.
- 5 Ekawit Kittiya, Waraporn Nuntiyakul, **Achara Seripienlert**, Paul Evenson, Alejandro Saiz, David Ruffolo, and Sueyon Oh. “Cosmic Ray Flux Correlation between McMurdo and Jang Bogo Neutron Monitor Stations vs. Time Lag”. In: *EGU General Assembly Conference Abstracts*. EGU General Assembly Conference Abstracts. May 2022, EGU22-4215, EGU22-4215. [DOI](#): 10.5194/egusphere-egu22-4215.

- 6 Wirin Sonsrettee, Piyanate Chuychai, **Achara Seripienlert**, Paisan Tooprakai, Alejandro Sáiz, David Ruffolo, William Henry Matthaeus, and Rohit Chhiber. "Magnetic Field Line Path Length Variations and Effects on Solar Energetic Particle Transport". In: *EGU General Assembly Conference Abstracts*. EGU General Assembly Conference Abstracts. May 2022, EGU22-3394, EGU22-3394. [DOI: 10.5194/egusphere-egu22-3394](#).
- 7 P. Yakum, S. Khamphakdee, W. Nuntiyakul, D. Ruffolo, P. Evenson, P. S. Mangeard, A. Sáiz, C. Banglieng, **A. Seripienlert**, P. Jiang, P. Chuanraksasat, K. Munakata, J. Madsen, B. Soonthornthum, and S. Komonjinda. "Response functions of semi-leaded neutron monitor count rates and leader rates from latitude surveys during 2019-2020". In: *37th International Cosmic Ray Conference*. Mar. 2022, 1251, p. 1251. [DOI: 10.22323/1.395.01251](#).
- 8 A. Pagwhan, W. Nuntiyakul, **A. Seripienlert**, P. Evenson, P. S. Mangeard, A. Sáiz, D. Ruffolo, and S. Seunarine. "Determination of Yield Functions of Neutron Counters at the South Pole from Monte-Carlo Simulation". In: *37th International Cosmic Ray Conference*. Mar. 2022, 1246, p. 1246. [DOI: 10.22323/1.395.01246](#).
- 9 **A. Seripienlert**, W. Nuntiyakul, S. Khamphakdee, P. S. Mangeard, A. Sáiz, D. Ruffolo, K. Fongsamut, P. Jiang, P. Chuanraksasat, P. Evenson, K. Munakata, J. Madsen, B. Soonthornthum, and S. Komonjinda. "Validation of Monte Carlo Yield Function of a Semi-Leaded Neutron Monitor using Latitude Survey Data in 2019 and 2020". In: *37th International Cosmic Ray Conference*. Mar. 2022, 1243, p. 1243. [DOI: 10.22323/1.395.01243](#).
- 10 P. Evenson, J. Clem, P. S. Mangeard, W. Nuntiyakul, D. Ruffolo, A. Sáiz, **A. Seripienlert**, and S. Seunarine. "Multiple Particle Detection in a Neutron Monitor". In: *37th International Cosmic Ray Conference*. Mar. 2022, 1240, p. 1240. [DOI: 10.22323/1.395.01240](#).
- 11 William Matthaeus, Rohit Chhiber, David Ruffolo, Wirin Sonsrettee, Paisan Tooprakai, **Achara Seripienlert**, Piyanate Chuychai, Alejandro Saiz, Arcadi Usmanov, and Melvyn Goldstein. "Effect of magnetic field line random walk on solar energetic particles: Spreading and path lengths". In: *AGU Fall Meeting Abstracts*. Vol. 2021. Dec. 2021, SH52B-02, SH52B-02.
- 12 William Matthaeus, Rohit Chhiber, Christina M. S. Cohen, David Ruffolo, Wirin Sonsrettee, Paisan Tooprakai, **Achara Seripienlert**, Piyanate Chuychai, Arcadi V. Usmanov, Melvyn. L. Goldstein, and David J. McComas. "Magnetic Field Line Random Walk and Solar Energetic Particle Path Lengths". In: *EGU General Assembly Conference Abstracts*. EGU General Assembly Conference Abstracts. Apr. 2021, EGU21-13959, EGU21-13959. [DOI: 10.5194/egusphere-egu21-13959](#).
- 13 P. Tooprakai, **A. Seripienlert**, D. Ruffolo, P. Chuychai, and W. Matthaeus. "Simulations of Lateral Transport and Dropout Structure of Energetic Particles from Impulsive Solar Flares". In: *35th International Cosmic Ray Conference (ICRC2017)*. Vol. 301. International Cosmic Ray Conference. July 2017, 135, p. 135. [DOI: 10.22323/1.301.0135](#).
- 14 W. H. Matthaeus, D. J. Ruffolo, P. Tooprakai, **A. Seripienlert**, and P. Chuychai. "Simulations of Lateral Transport and Dropout Structure of Energetic Particles from Impulsive Solar Flares". In: *AGU Fall Meeting Abstracts*. Dec. 2016, SH43B-2567, SH43B-2567.
- 15 W. H. Matthaeus, D. J. Ruffolo, **A. Seripienlert**, P. Tooprakai, and P. Chuychai. "Dropouts, spreading, and squeezing of solar particle distributions and space weather variability". In: *AGU Fall Meeting Abstracts*. Vol. 2015. Dec. 2015, SH32B-08, SH32B-08.
- 16 W. Mitthumsiri, **A. Seripienlert**, D. Ruffolo, P. S. Mangeard, A. Saiz, and U. Tortertmpun. "Simulations of Polar-Region Atmospheric Ionization Induced by the Ground Level Enhancement of January 20, 2005". In: *34th International Cosmic Ray Conference (ICRC2015)*. Vol. 34. International Cosmic Ray Conference. July 2015, 196, p. 196. [DOI: 10.22323/1.236.0196](#).
- 17 D. J. Ruffolo, P. Tooprakai, **A. Seripienlert**, P. Chuychai, and W. H. Matthaeus. "Squeezing of Particle Distributions by Expanding Magnetic Turbulence and Space Weather Variability". In: *AGU Fall Meeting Abstracts*. Vol. 2014. Dec. 2014, SH43A-4180, SH43A-4180.

- 18 **A. Seripienlert**, W. Mitthumsiri, A. Saiz, D. J. Ruffolo, P. S. Mangeard, and U. Tortempun. "Ionization in Earth's atmosphere following the solar storm on January 20, 2005". In: *AGU Fall Meeting Abstracts*. Vol. 2014. Dec. 2014, SH11A-4027, SH11A-4027.
- 19 P. Tooprakai, **A. Seripienlert**, D. J. Ruffolo, P. Chuychai, and W. H. Matthaeus. "Collimation of Particle Beams by the Structure of Two-Dimensional Magnetic Turbulence". In: *AGU Fall Meeting Abstracts*. Vol. 2010. Dec. 2010, SH33B-1836, SH33B-1836.

## Skills

Languages	📖 Thai and English (TOEIC Score 930).
Programming Languages	📖 C, Fortran, and Python.
Data Visualization	📖 IDL, GNU Plot, and Python.
Software	📖 FLUKA, Flair, Visual Basic, Delphi and ROOT
Computer cluster admin.	📖 RED HAT, Rock cluster, and mpi installation.
Computer admin.	📖 Microsoft Windows, Linux and Debian
Graphic production	📖 Adobe Illustrator and Adobe Photoshop
Document	📖 Microsoft Office Word, Excel, PowerPoint, Publisher, Visio, L <sup>A</sup> T <sub>E</sub> X, and Foxit Phantom.
Academic	📖 Research, teaching, training, consultation, services, and documents (Proposal, Reports, TQE, and SAR).

## Professional Experience and Awards


### Awards and Scholarships

- 2009 📖 **Award of achievement in recognition of the outstanding paper in computational physics session, 13<sup>th</sup> International Annual Symposium on Computational Science and Engineering, March 25-27, 2009.** Awarded by Kasetsart University, Bangkok Thailand.
- 2008 – 2009 📖 **Received a Research Assistantship.** Thailand Center of Excellence in Physics.
- 2004 – 2010 📖 **Received a Teaching Assistant scholarship.** Faculty of Science, Mahidol University.

### Research Grants

- 2023 – 2024 📖 **Program Management Unit for Human Resources & Institutional Development, Research and Innovation (PMU-B): High Caliber Impact Oriented Researchers.**  
 Project title: *Building a world-leading network of IceCube Neutrino Observatory for high-energy particles from space.*  
 Position: Co-Investigator  
 Budget: 4,000,000 Baht
- 📖 **Program Management Unit for Human Resources & Institutional Development, Research and Innovation (PMU-B): High Caliber Impact Oriented Researchers (Earth Space System).**  
 Project title: *Science and technology of measuring high energy particles and plasma in space.*  
 Position: Co-Investigator  
 Budget: 4,000,000 Baht

## Professional Experience and Awards (continued)

- 2022 – 2024  **National Research Council of Thailand (NRCT) and National Science and Technology Development Agency (NSTDA).**  
Project title: *Space Radiation Science and Technology.*  
Position: Co-Investigator  
Budget: 14,977,000 Baht
- FY 2021 – 2023  **Fundamental Fund via Thailand Science Research and Innovation (TSRI).**  
Project title: *Latitude survey of geomagnetic cutoff rigidity and space telescope detection.*  
Position: Principal Investigator (PI)  
Budget: 4,913,200 Baht






## Academic Service Activities

- 2021 – Present  **Associated membership.** IceCube collaboration.  
 **Committee.** Thai-Antarctic Neutrino Observatory (TANO).
- 2023  **Invited Instructor in Session “Virtual Reality Experience”,** 1<sup>st</sup> Thai Ice-Cube VR Experience, Bangkok, March 15-16, 2023.
- 2022  **Visiting Wisconsin IceCube Particle Astrophysics Center (WIPAC),** 1 June to 31 July, 2022.  
 **Invited Instructor in Session “FLUKA Workshop”,** 6<sup>th</sup> Neutron and Neutrino Detector Bootcamp, Chiang Mai, December 22-27, 2022.  
 **Invited Instructor.** ThaisCube, Chiang Mai, September 6-9, 2022.
- 2021  **Invited Instructor in Session “FLUKA Workshop”,** 5<sup>th</sup> Neutron Monitor Bootcamp, Chiang Mai, December 24-29, 2021.  
 **Examination Creator for Police Candidates in Forensic Science.** Royal Thai Police, December 3-6, 2021  
 **External Expert.** Program in Astronomy, Graduate School, Chiang Mai University.
- 2020  **Invited Instructor in Session “Thai Consortium in Space weather and future collaborations with Thai involvement”,** Post Neutron Monitor Bootcamp, Chiang Mai, December 24-27, 2020.  
 **Invited Instructor in Session “Particles Simulation and Applications to Research”,** 3<sup>rd</sup> Neutron Monitor Bootcamp, Songkhla, July 27-31, 2020.
- 2016  **Trainer in Annually Stargazing Project.** Nakhon Ratchasima, March, 2016  
 **STEM Ambassador in Thailand.**
- 2015  **Chairman in the session of Physics, Earth Science and Applied Physics of the International Conference on Science and Technology (TICST2015),** Rajamangala University of Technology Thanyaburi, November 4-6, 2015  
 **Trainer in Annually Stargazing Project.** Chaing Rai, January 30 to February 1, 2015
- 2014  **Trainer in Secondary School Teachers in Session “Fundamental Physics”,** Chandrakasem Rajabhat University in Chai-Nat Province, August 15-17, 2014.
- 2014 – 2016, 2020 – 2021  **Marker.** The National Astronomy Olympiad.


## Professional Experience and Awards (continued)


- 2013  **Trainer in Training Session “Monte Carlo Simulation of Secondary Cosmic Rays in Earth’s Atmosphere”.** 1<sup>st</sup> COSPAR Symposium, Bangkok, November 11-15, 2013
-  **Trainer in Demonstration Session “Particle Transport Simulation Using Monte Carlo Method”.** 2<sup>nd</sup> Thailand Experimental Particle Physics Novice Workshop, Mahidol University, March 25-29, 2013
- 2012  **Chair in Session, The 15<sup>th</sup> International Conference of International Academy Physical Sciences (CONIAPS XV).** Rajamangala University of Technology Thanyaburi, Thailand, Dec 9 - 13, 2012
-  **External Expert Committee on Applied Physics Curriculum.** Division of Physics, Faculty of Science, Rajamangala University of Technology Thanyaburi, Thailand, May 2012
- 2004 – 2009  **Trainer in Open House “Cosmic Rays and Space Weather”.** Faculty of Science, Mahidol University

## Teaching Experiences

- 2014 – 2016  **Lecturer.** Vibration and Waves, Modern Physics, Advance Physics Laboratory, Intermediate Physics Laboratory, Introductory Physics Laboratory, Physics for Engineers 1, Physics for Engineers 2, Cooperative. Division of Physics, Faculty of Science, Rajamangala University of Technology Thanyaburi
- 2012 – 2013  **Special Lecturer.** Introduction to Mechanics. Faculty of Science, Chandrakasem Rajabhat University
- 2009 – 2010  **Teaching Assistant.** Physics Laboratory. Mahidol University International College
- 2008  **Special Lecturer.** Principles of Physics. Faculty of Science and Technology, Rajamangala University of Technology Thanyaburi
- 2004 – 2010  **Teaching Assistant.** General Physics Laboratory and Physics Laboratory. Faculty of Science, Mahidol University

## References

**Asst. Prof. Dr. Waraporn Nuntiyakul**  
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Faculty of Science,  
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