Press Release

Sept. 12 2022
Association of Asia-Pacific Physical Societies (AAPPS)
Division of Plasma Physics (AAPPS-DPP)

Subramanyan Chandrasekhar Prize of Plasma Physics

– Professor Arnab Rai Choudhuri is selected as 9th (2022) Laureate –

The Division of Plasma Physics (CEO: Mitsuru Kikuchi, Chair: Baonian Wan) under the Association of Asia Pacific Physical Societies (President: Jun'ichi Yokoyama) has selected Professor Arnab Rai Choudhuri of the IISc (Indian Institute of Science), Bengaluru as the 9th (2022) Laureate of S. Chandrasekhar Prize of Plasma Physics, which is awarded to scientist who have made seminal / pioneering contributions in the field of plasma physics.

Citations

Arnab Rai Choudhuri: *For the key role in developing the flux transport solar dynamo model of the 11-year sunspot cycle, and for using this model to provide theoretical explanations of many solar phenomena, as well as the first successful dynamo-based prediction of a sunspot cycle.*

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AAPPS-DPP Association Inc. : Representative Director and CEO, Mitsuru Kikuchi, TEL: +81-80-1115-3482
Vice Chair for Solar/Astro Plasma Physics: Ryoji Matsumoto, http://www.astro.phys.s.chiba-u.ac.jp/~matumoto/index.html
AAPPS-DPP Homepage Address : http://aappsdpp.org/AAPPSDPPF/index.html

Certificates of 2022 S. Chandrasekhar Prize of Plasma Physics
Certificate and medal will be virtually given at the 6th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP2022 online e-conference) Oct. 9-Oct 14, 2022.

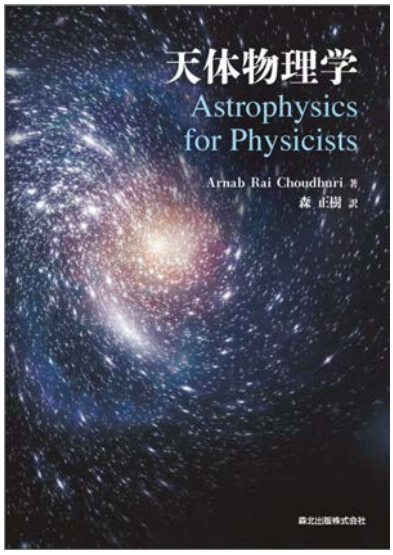
Press Release

On the achievements of Professor Arnab Rai Choudhuri

Prof. Arnab Rai Choudhuri

Born in Kolkata in 1956, Arnab Rai Choudhuri obtained his BSc and MSc respectively from Presidency College, Kolkata, and Indian Institute of Technology, Kanpur. Then he went to graduate school at the University of Chicago, where he received the Valentine Telegdi Prize for topping the Physics Candidacy Examination and worked under the supervision of Prof. E.N. Parker, obtaining his PhD in 1985. He joined the faculty of Indian Institute of Science in 1987 and retired recently from there as Professor.

Choudhuri has studied MHD processes in different astrophysical systems – especially the Sun. His early simulations on the formation of sunspots by the buoyant rise of magnetic flux tubes from the solar interior to the surface showed how bipolar sunspots form on the solar surface (D'Silva & Choudhuri 1993). These simulations showed that the magnetic field in the solar interior has to be much stronger than what was expected from the αΩ dynamo model popular at that time. This led to the formulation of a new type of dynamo model: the flux transport dynamo model. The paper by Choudhuri, Schüssler & Dikpati (1995) is regarded as the foundational paper of this model. Choudhuri has also been involved in understanding within the framework of this model how the irregularities in the sunspot cycle arise. His group made the first successful dynamo-based prediction of a sunspot cycle before its onset (Choudhuri, Chatterjee & Jiang 2007), for cycle 24 which reached its peak around 2014, and provided a comprehensive model of grand minima like the Maunder minimum during 1645–1715 when sunspots were rarely seen (Choudhuri & Karak 2012).



Japanese translation of his book

Passionately interested in teaching, Choudhuri is the author of two graduate textbooks – *The Physics of Fluids and Plasmas: An Introduction for Astrophysicists* (1998, Cambridge University Press) and *Astrophysics for Physicists* (2010, Cambridge University Press) used in many universities around the world. He is deeply interested in the history of science and is currently involved in a study of how research in modern physics began in colonial India.

His total citation is ~4100 in Web of Science with H-index 34 (average per item ~55) and is ~6700 in Google Scholar with H-index 40 (17 items having more than 100 citations). He is an elected Fellow of Indian National Science Academy, Indian Academy of Sciences and The World Academy of Sciences (TWAS). He has been an Alexander von Humboldt Fellow and a J.C. Bose National Fellow.

Appendix:

1. Subrahmanyan Chandrasekhar

Astrophysicist born in India. He received the Nobel Prize in Physics in 1983 *for his theoretical studies of the physical processes of importance to the structure and evolution of stars,* including the Chandrasekhar limit on the mass of white dwarf stars. His research covered several broad areas, as seen from his texts, which included *Principles of Stellar Dynamics* (1942), *Hydrodynamics and Hydromagnetic Stability* (1981), and an influential book based on his lecture notes in *Plasma Physics* (1960).

2. AAPPS: Association of Asia-Pacific Physical Societies

(HP: http://www.aapps.org/main/index.php)

The Association of physical societies in the Asia Pacific region founded by the Nobel Laureate in Physics C.N. Yang, and Professor Akito Arima in 1983. The AAPPS held the 12th Asia Pacific Physics Conference under the president (at that time) Shoji Nagamiya in Makuhari, Japan. The current president is Professor Jun'ichi Yokoyama, the University of Tokyo, Japan.

3. AAPPS-DPP: Division of Plasma Physics, AAPPS

(HP : http://aappsdpp.org/AAPPSDPPF/index.html)

The first division under the AAPPS based on the success of the plasma physics program in the APPC-12. This division was formed in January 2014 based on the recommendation of Professor Nagamiya at the AAPPS council. From Nov 28, 2018, AAPPS-DPP becomes legal entity http://aappsdpp.org/DPPhoujin/index.html .

4. Subrahmanyan Chandrasekhar Prize of Plasma Physics

Subrahmanyan Chandrasekhar Prize of Plasma Physics is a top plasma physics prize founded by the AAPPS-DPP in July 2014 and is endorsed by AAPPS. This prize is given to a plasma physicist annually for pioneering and/or seminal contribution to plasma physics. The prize recipients were Professor S. Ichimaru (2014), Professor P. Kaw (2015), Professor D. Melrose (2016), Professors C.Z. Cheng and Lou C. Lee (2017), Professor Toshiki Tajima (2018), Professors Liu Chen and Kazunari Shibata (2019), Professor Hyeon Park (2020), Professor Taik Soo Hahm (2021) (http://aappsdpp.org/AAPPSDPPF/prizetable.html).

The 2022 Selection Committee composed of leading plasma physicists in Asia-Pacific region.
Chairman : Professor Wonho Choe (Korea Advanced institute of Science and Technology)
Members : Professor Liu Chen (Zhejiang University)
Professor Yutong Li (Institute of Physics, CAS)
Professor Yasuaki Kishimoto (Kyoto University)
Professor Kanya Kusano (Nagoya University)
Professor Donald Melrose (University of Sydney)
Professor Iver Cairns (University of Sydney)
Professor Rajaraman Ganesh (Institute for Plasma Research)
Professor Ravindra Kumar (Tata Institute of Fundamental Research)
Professor Lou-Chuan Lee (Academia Sinica)
Professor Kwo Ray Chu (National Taiwan University)
Professor Hyyong Suk (Gwangju Institute of Science and Technology)
Professor Yong-Su Na (Seoul National University)