

National Award in the field of Polar Science & Cryosphere**Shri Arun Chaturvedi**

Shri Arun Chaturvedi is currently the Director of the Glaciology Division and also of the Polar Studies Division of Geological Survey of India (GSI). He is supervising the glaciological work of GSI in Himalayas and Antarctica and Arctic.

He holds a Master's degree in Geology (1978) from University of Lucknow. He entered GSI as a Geologist, through the UPSC-Batch of 1979, and has continued to serve with the GSI. In the early years of his profession, he has worked as a field-geologist in the Aravali Ranges of Rajasthan on Carbonatites and associated mineralization; mapping of the Thar Desert in Rajasthan, reporting some buried sweet-water channels; and mapping of Lesser Himalayan rocks of Arunachal Pradesh, with foot traverses in unexplored terrains.

From 1990 to 2009, he has actively participated in the Indian Antarctic Expeditions. His work in Antarctica was focused on the field-aspects of glaciological studies; providing crucial inputs to Climate Change observations. He is one of the pioneers of Indian Ice Core Drilling Program in Antarctica. He has coordinated the team-work that has generated ice cores ranging from deep interior mountains near the Polar Plateau, up to the coastal ice sheets of Antarctica. These ice-cores have provided the essential base-samples for analyses and publication of dozens of climate change papers by various Indian scientists in many national and international journals.

In 2007-2009, during the polar winter, he initiated the program for bathymetric profiling of frozen lakes of Schirmacher Oasis. By fabricating new innovative mounting techniques of vehicle-trailed and GPS-linked MLF-antenna of the Ground Penetrating Radar (GPR), his team carried out detailed bottom-profiling of 19 frozen lakes. This work generated the first-ever scientific data from some of the Epi-shelf Lakes, which are situated on the continental margin, are very large and deep, and are still connected to the Antarctic Ocean below the floating ice-shelf on the surface. GPR-profiling has also brought out precise localization of sediment-deposits within these lakes; which forms the foundation of lake sediment coring programs for future climate change studies.

He was the Leader & Station Commander of three Indian Antarctic Expeditions, (the 15th, 19th and 27th) and was also the NCAOR-Observer in

two Indian Antarctic Expeditions (22nd and 25th). Under his Leadership, all the scientific and logistic targets of these national expeditions were successfully achieved. A significant contribution by him is the massive logistic coordination in 2007, for transportation and installation of the bulky parts of satellite receiving 'Earth Station' from ship to Maitri in Antarctica. This success has resulted in online-transmission of scientific data from Antarctica to India; along with video-conferencing and TV-reception facilities at Maitri station.

In 2011, he participated in the Indian glaciological work in Svalbard, Arctic. In addition to the standard glaciological field-observations, he initiated the GPR Depth-profiling of the Arctic glaciers. This has brought out the entire basin configuration of studied glaciers, from the accumulation zone up to the ablation zone; providing vital inputs for quantification of the Arctic glacial recession models under the current Global Warming effect.

From 2010 to 2014, he has supervised many glaciological expeditions in Himalayas. With his GSI-teams, he has carried out field-work on remote glaciers of Ladakh in J&K; Kumaon in Uttarakhand; Spiti, Lahaul and Kinnaur in Himachal Pradesh. These glaciological observations have provided the much needed field-inputs to climate change studies in India; validating or disproving the inferences of remote sensing studies done by many national institutions. He has personally led the GPR-profiling work within the inaccessible accumulation zones of Himalayan glaciers, generating the first-ever three-dimensional views of these remote glacier basins.

Under the effect of Global Warming, most of the Himalayan glaciers are melting and receding; resulting in formation of new pro-glacial lakes. Many of these lakes are held by unstable moraine-dams; enormously increasing the risk of GLOF (Glacial Lake Outburst Floods) to human habitations in Indian Himalayas. Shri Arun Chaturvedi has initiated programs of mapping of Moraine-Dammed Pro-glacial Lakes (MDPL) and monitoring the expansion of their area in Himachal Pradesh and Uttarakhand. He, along with his teams, have visited and mapped dangerously growing MDPLs in remote and inaccessible glacier terrains, using high precision field-surveying instruments; validating the remote sensing data. Detailed reports, along with suggested remedial measures, have been compiled and sent to the concerned Civil Authorities and also to the National Disaster Management Agency (NDMA). This glaciological work started by Shri Arun Chaturvedi has a very high societal value under the current Global Warming scenario.

In 2012 and 2014, Shri Arun Chaturvedi has been a Supervisor and a Faculty in two national "*Field Courses in Glaciology*", conducted by the GSI on Hamtah Glacier in Himachal Pradesh (sponsored by the DST). The field-courses had the objective of generating trained glaciological manpower in the country. These

two courses have trained 36 professionals from various institutions of India. Also, during 2010-2014, as a Member of the Program Advisory Committee on Himalayan Glaciology (DST), Shri Arun Chaturvedi has provided vital field-inputs in steering the glaciological programs of various national institutions.

In addition to many scientific publications in peer-reviewed journals and symposiums, Shri Arun Chaturvedi was the Editor of the Antarctic Expedition Reports brought out by NCAOR. With the objective of spreading societal awareness about Indian Antarctic Programs, he has written a popular-science book in Hindi, "*Rochak aur Romanchak Antarctica*". This book was given the First Prize of 2006 by the Department of Ocean Development. During 2006-2014, he has received many appreciative communications from young expedition-members, who were inspired to participate in the Indian Antarctic Program only after reading this book.

Shri Arun Chaturvedi has received the prestigious 'National Mineral Award' of 2004 for his significant contribution to Antarctic Research. He has also received the 'Antarctica Award' of 2004 from the Department of Ocean Development, for his contributions to Indian Antarctic Expeditions.

In recognition of outstanding contributions to the Polar Science and Cryosphere the Ministry of Earth Sciences honors Shri Arun Chaturvedi with "National Award in Polar Science and Cryosphere" for the year 2015.