After the demise of fabled and widely celebrated theoretical physicist and cosmologist, Professor Stephen William Hawking on 14 March 2018, a sense of void-ness engulfed the academic as well as non-academic circles alike. But we are hardly aware of a home-grown scientist based in Calcutta who had a consequential impact on Hawking’s research work.

In 1915, Einstein startled the world through his enigmatic proposed theory ‘General Theory of Relativity’ (GTR) that transformed our understanding of the nature of space and time and it also transformed the understanding of classical physics from a new perspective. It is a geometrical theory of gravitation that generalises Sir Isaac Newton’s Law of universal gravitation and special relativity, providing a unified explanation of gravitation as a geometric property of space and time or space-time (that gravitation is not caused due to force but rather manifestation of curved space and time), with this curvature being generated by the mass-energy and momentum of whatever matter and radiation present.

The theory is believed to be the most successful gravitational theory which is universally accepted and well adduced by observations. The first success of GTR was in delineating the anomalous perihelion precession of Mercury. Since then, the theory has been used to define all manner of physical phenomena, including bending light, black holes and the expanding universe.

A Supernova Remnant (SNR) is a diffuse, expanding nebula resulting from a spectacular explosion of a star in which it ejects most of its mass in a violently expanding cloud of debris. If the remnant is massive enough (heavier than few solar masses), then the remnant itself squeezes inwards by gravity, forming a singularity, or black hole (one of the ways in which black hole forms).

In this regard, there is a relationship between the theoretical investigations of Stephen Hawking and Amal Kumar Raychaudhuri from Calcutta. Popularly known as AKR, he was remarkable but a lesser-known physicist. Educated at Presidency College and University of Calcutta, he subsequently
In general relativity, the Raychaudhuri equation plays a significant role to explain the space-time singularities and gravitational focusing properties in cosmology. He aimed to address the fundamental question of singularity in the most simple and general form...

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There is such wide acceptability of this equation like other notable equations in physics like ‘the Dirac equation and Schroedinger equation’ that nobody cares about its origin or date of publication. The Raychaudhuri equation paved the way for later research into the singularity problem. It would find its place in venerable textbooks on general relativity and relativistic cosmology. The equation will stand firm so long Einstein’s GTR stands. The equation remains a prime tool to investigate the behaviour of black hole horizons. One would wonder if there is any research work of such grade to have emerged in post-independent India.

AKR symbolised excellent scholarship and erudition. His biography was authored by J.V. Narlikar and in 2005 a documentary film had been produced on his life and work. His research work is as consequential as it could have got. We remember the monumental contributions of Stephen Hawking, Jagdish Chandra Bose, Meghnad Saha, Satyendra Nath Bose, Subrahmanyan Chandrasekhar, C.V. Raman, etc. We also need to remember his contributions.

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