

Harish-Chandra

Harish-Chandra was born in Kanpur on the 11th of October 1923 to Chandrakishore and Chandrarani. The men in the family were professionals (lawyers, engineers), and on his mother's side, the women had obtained convent education even during the last century. Chandrakishore was an irrigation engineer who spent much of his time in the districts of U.P. Influenced by the times, he became a staunch Gandhian and dropped his surname because of his opposition to caste. Harish-Chandra initially studied with private tutors until the age of nine, when he was directly enrolled in the seventh class. During his childhood and youth, he liked to paint, although later he gave up painting altogether.

Contact with Prof. K S Krishnan at Allahabad University during his M.Sc. changed his future. Prof. Krishnan was quick to recognize Harish-Chandra's extraordinary mathematical skills and encouraged him to take up physics as a career. Harish-Chandra was persuaded to go to the Indian Institute of Science, Bangalore where he worked with Homi Bhabha during 1943–45. The first six months of his stay in Bangalore were spent with old friends from Allahabad, Mr and Mrs. G T Kale. It was here that he got to know their daughter Lalitha, and many years later when he returned to India on a visit in 1952, she became his wife. The war in Europe over, Harish-Chandra left for Cambridge to work with Paul Dirac. This was the genesis of a long friendship and

Harish-Chandra credits Dirac with being one of the most important influences on his life. For his Ph.D. thesis Dirac suggested a study of the infinite dimensional representations of the Lorentz group. Harish-Chandra completed this work about the same time as I M Gelfand and M A Naimark in the erstwhile Soviet Union, and V Bargmann in the United States.

Harish-Chandra spent the year 1947 – 48 in the U.S.A. as Dirac's assistant. His earlier doctoral work together with a year of attending lectures by Claude Chevalley and Emil Artin — and the recipe for the conversion of Harish-Chandra from a physicist to a mathematician was complete. He always regarded physics with a certain amount of awe and claimed that you needed to have a sixth sense to be a successful physicist, something he thought he lacked. He preferred the unfettered freedom of mathematics.

For the next 15 years Harish-Chandra was at Harvard, Princeton or Columbia. There was a break of a year in 1952–53 which he spent at the Tata Institute of Fundamental Research, briefly flirted with but then abandoned the idea of returning to India. During these years he was building the monument for which he is famous, the general theory of semi-simple Lie groups and the construction of the Plancherel measure for such groups. He became a professor at the Institute for Advanced Study, Princeton in 1963 and he announced that he had the general



Plancherel formula at the International Congress of Mathematicians, Moscow 1966. Then followed several long papers to support his claim. He then turned his attention to reductive groups over the p -adics because "there is no reason why the reals should be more important than any other completion of the rationals." In the words of R P Langlands "Harish-Chandra was one of the outstanding mathematicians of his generation, an algebraist and analyst, and one of those responsible for transforming infinite-dimensional group representation theory from a modest topic on the periphery of mathematics and physics into a major field central to contemporary mathematics." Harish-Chandra worked incredibly hard, often all night through, night after night. This took its toll and his health deteriorated. He published just one joint paper with A Borel in 1960 at the time of his first serious illness.

Harish-Chandra won the Coles Prize of the American Mathematical Society in 1954, the Srinivasa Ramanujan Medal of INSA in 1974, became a Fellow of the Royal Society in 1973 and a member of the National Academy of Sciences, U.S.A. in 1981. He was made the IBM von Neumann Professor at the Institute for Advanced Study in 1968.

During a talk on the 80th birthday celebration for Dirac, Harish-Chandra said "I have often pondered over the roles of knowledge or experience on the one hand, and imagination

or intuition, on the other, in the process of discovery. I believe that there is a certain fundamental conflict between the two and knowledge, by advocating caution, tends to inhibit the flight of imagination. Therefore a certain naiveté, unburdened by conventional wisdom, can sometimes be a positive asset. I regard Dirac's discovery of the relativistic equation of the electron as a shining example of such a case." Harish-Chandra, like most creative mathematicians, believed in the dictum "Mathematics is like music; you must practise it in order to be able to teach it."

Harish-Chandra died on 16 October 1983.

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