Recent observational and experimental evidence for the presence of complex organics in space is reviewed. Remote astronomical observations have detected ~200 gas-phase molecules through their rotational and vibrational transitions. Many classes of organic molecules are represented in this list, including some precursors to biological molecules. A number of unidentified spectral phenomena observed in the interstellar medium are likely to have originated from complex organics. The observation of these features in distant galaxies suggests that organic synthesis had already taken place during the early epochs of the Universe. In the Solar System, almost all biologically relevant molecules can be found in the soluble component of carbonaceous meteorites. Complex organics of mixed aromatic and aliphatic structures are present in the insoluble component of meteorites. Hydrocarbons cover much of the surface of the planetary satellite Titan and complex organics are found in comets and interplanetary dust particles. The possibility that the early Solar System, or even the early Earth, have been enriched by interstellar organics is discussed.

References


About the speaker

Sun Kwok is the Director of the Laboratory for Space Research and Chair Professor of Space Science at the University of Hong Kong. He has previously served as Director and Distinguished Fellow of the Academia Sinica Institute of Astronomy and Astrophysics in Taiwan, and Faculty Professor at the University of Calgary in Canada. He currently serves as President of IAU International Astronomical Union (IAU) Commission on Astrobiology. Previously, he has served as the President of IAU Commission on Interstellar Matter (2012-2015) and chairman of IAU Planetary Nebulae Working Group (1994-2001).