# §33. Establishment of Atomic and Molecular Data Application Forum

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Recent fast, significant and remarkable advancement we have witnessed in past decades in areas such as high-tech. industries, medical research, environmental science, atmospheric science, fusion sciences as well as other basic sciences including astrophysics and radiation physics and chemistry fully depend on extensive utilization of atomic and molecular (A&M) data for structures and dynamical processes not only for basic understanding of various phenomena, but also establishing guiding new key principles and basic technologies based on simulations with this accurate and complete A&M data basis. Without this A&M data basis, such an impressive progress of our technologies and basic understandings of nature would not have been realized. For example, NIFS A&M research group has concentrated on extensive activity of production, compilation and storage of A&M data for fusion research over more than two decades, and extensive A&M data base collected in NIFS A&M data center has been widely used by a variety of basic and applied scientists worldwide. It is now considered as one of the world intellectual properties and assets commonly shared by all human beings. National Astrophysical Observatory of Japan (NAOJ) has been concerned with collecting A&M data relevant to astrophysical and astronomical research, which includes A&M dynamical processes and also emission of light from atoms, ions and molecules for spectroscopic purposes and these data have made significant contributions to identifications of origins of various types of observed photons. Many electronic-engineering and material researchers in universities and industries have been extremely active to establish basic A&M data bases for further development of their thin-film manufacturing, etchings and other key technologies. As have been briefly highlighted, accurate, complete and comprehensive A&M data bases have served as the most important basis for development of key technologies and sciences. But orchestrated and collaborative efforts to produce, collect, evaluate and liberalize these A&M data from a variety of sectors of science and technology have not been materialized yet.

Therefore, we undertook this collaborative effort to establish the forum as a platform connecting between A&M data producers and data users as well as among data producers and users to integrate independent and isolated effort of data production and storage so that more efficient and complete data production and transmission could become possible.

In this year, under auspice of the Institute of Electrical Engineers of Japan (IEEJ), we opened new database[1] of recommended data for electron collision cross section compiled by a technical society of IEEJ. The database is accessible on-line at the NIFS A&M database server (http://dpc.nifs.ac.jp/DB/IEEJ/, see Fig. 1). It was conducted in a frame of developing a common platform of A&M databases in different areas of science and technologies.

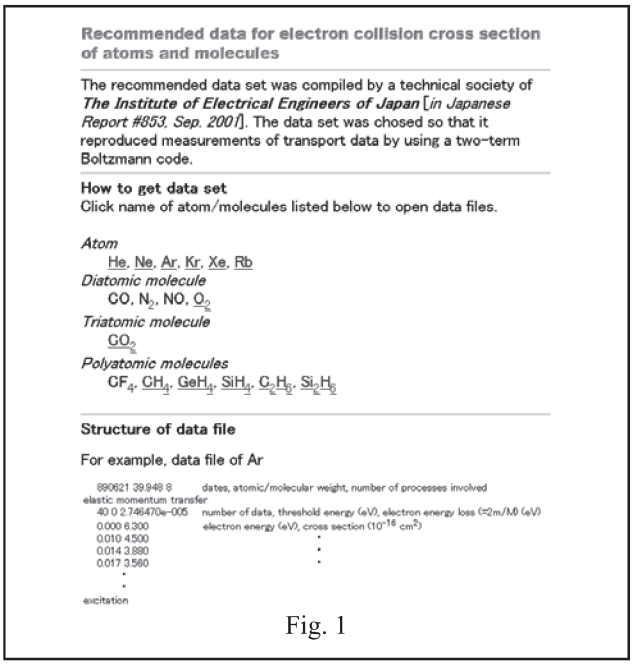


Fig. 1

1) Kato, D.: Symposium “Front lines of basic parameters and applications of discharge”, Annual meeting of IEEJ, Mar. 19-21, 2008, Fukuoka Inst. Tech.