Katsuo Tsukamoto

“Morphological stability”

Dr. Katsuo Tsukamoto is a Professor in the Department of Earth and Planetary Material Sciences, Graduate School of Science, Tohoku University, Sendai, Japan. He received his PhD on "In Situ Observation of Crystal Growth from Solution” from Tohoku University, Japan under the supervision of Professor I. Sunagawa in 1983. Professor Tsukamoto is the president of Commission on Mineral Growth and Interface Process of International Mineralogical Association (IMA). The emphasis of his research work is on "in situ" observation of crystal growth processes and is particularly interested in the growth surface analysis of solution grown crystals, not only at room temperatures but also at much higher temperatures as high as 1800K by developing new optical microscopy and interferometry techniques. He has recently developed Laser Confocal Phase-Shift Interferometry (LCPSI) technique, which is capable of revealing mono-molecular growth steps of protein crystals in situ with a precise step height of the order of nanometer. In addition to this, his expertises cover a wide range of research fields ranging from the origin of materials in the early solar system to the chirality of amino-acids and biomineralization. Professor Tsukamoto is also leading a project entitled "Crystallization 4.6 billion years ago", which is concerned with the experimental simulation of first crystallization process in the early solar system by utilizing microgravity conditions and by other levitation methods. He has successfully applied his "in situ" optical methods to this new field of crystal growth. He has also been interested in the defect generation of protein crystals in relation to the crystal growth mechanisms, for which he will carry out "in situ" observations of crystal growth in the International Space Station (ISS) in near future. Professor Tsukamoto has published more than 100 original peer reviewed research papers, 120 review articles and other papers on variety of fields. He has also contributed significantly by writing about 15 book chapters in the field of crystal growth. In recognition to his outstanding research accomplishments, he has received 5 honorable awards from various institutions like The Japan Association of Crystal Growth, The Japan Society of Mechanical Engineers, etc.