

# EARTH SCIENCE, RECYCLING & SPACE TECHNOLOGY

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### BIOGRAPHY

Y Cengiz Toklu did his BS, MS in Civil Engineering, Middle East Technical University, Turkey in 1967 and 1969; Dr. Ing. Institut de Mecanique Theorique et Appliquée, Faculté des Sciences, Université Paris VI (Pierre et Marie CURIE), Paris, France, 1976. His current research interest is in Optimization in engineering, nonlinear structural analysis, construction project scheduling, space civil engineering and engineering education. He is the creator of the method "Total Potential Optimization using Metaheuristic Algorithms (TPO/MA)" which gives very successful results in analyzing nonlinear and degenerate structural systems. Currently he is working on a project that aims at producing lunar soil simulant in Turkey.

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### SPACE HABITATIONS, TECHNICAL ASPECTS AND INTERNATIONAL COOPERATION

Being terrestrial for some millions of years, humanity is now advancing in the direction of being extra-terrestrial. Attempts made until now have all been successful, walking on the Moon, and living in stations for month's miles away from earth. In the coming decades, it is easily predictable that men will spend time on Moon in lunar shelters for periods longer than "Short visits". This will be followed by going to Mars and other space bodies. Such achievements will be realized thanks to space research conducted in space agencies all around world, especially by countries who can afford huge amounts of money in this field. In fact, space research is a multi-dimensional, multi-disciplinary field where important contributions can be made without having much financial support. Such an approach, evidently, will increase international cooperation in the field and will help increasing technological and scientific levels of all countries that join this research subject. Designing shelters specially adapted to lunar environmental conditions, and finding ways of construction techniques for building them but a field where many researchers from many countries can attack; A related field is producing lunar soil simulants on earth and making experiments on them for using lunar soil as the only in situ resource available in construction and for extracting other compounds and elements that will be needed for human survival on Moon. It is to be noted that up to date nine countries have produced lunar soil simulants and this number is increasing continuously. It is remarkable also that among these countries there are some who cannot be classified as financially very strong capable of sending probes to Moon or Mars or even to Earth's orbit. This proves the feasibility of conducting space research internationally with as much as countries and organizations on Earth.