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Editorial

Welcome to *Crystals*: A New Open-Access, Multidisciplinary Forum for Growth, Structures and Properties of Crystals

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The majority of the earth's crust is made up of crystalline material. The research areas of mineralogy, petrology, chimie minerále (inorganic chemistry) and, of course, crystallography outgrew from the fascination of mankind with the color and symmetry of crystals. Crystals have translational symmetry in two or three dimensions, quasicrystals have translational symmetry in higher spaces. Further symmetries may be observed by the eye, by microscopic techniques or by the diffraction of X-ray, electron, or neutron beams. Diffraction techniques are also used, due to Max von Laue's eminent discovery a century ago, to determine crystal structures.

Crystals are built by atoms, ions, or molecules. These subjects are held together by electrostatic forces. They may be organized in zero to three dimensions; polymeric partial structures are observed in one, two, or three dimensions. The particular arrangements are responsible for the physical properties of crystals. For example, ionic crystals typically have high and molecular crystals have low melting points. Transport of ions or electrons leads to electrical conductivity; cooperative vibrations to heat transport. Absorption of light is responsible for the color of crystals; emission of light after excitation with virtually all wavelengths is the source of modern lighting. The absence of a center of symmetry is the origin of non-linear optics. Ordering of spins is important for a large variety of magnetic phenomena.

The variety of properties does not only depend on the composition and structure of crystals, but also depends on their size. For large crystals, the surface area is not really important; smaller crystals, especially nano-crystalline materials, have higher surface areas and may have special catalytic or other properties. Thin films—quasi-two-dimensional crystals—also have high surface areas and special properties.

All areas of chemistry dealing with solids deal with crystals. Crystal structure determination (with X-rays as an in-laboratory routine) has become fast and is the analytical procedure for crystalline solids to determine composition and structure, not only for high-melting salts, but also for molecular and coordination compounds, or bio-molecules. It is also the basis for the calculation of electronic

structures by quantum-chemical methods. The properties of crystalline solids are of interest for all kinds of scientists, be they physicists, mineralogists, or biologists.

The new open-access journal *Crystals* expects to provide a forum for rapid publication of papers dealing with all these varieties of crystal research and application of crystals. This will include solid state chemistry and physics, crystal growth (design and engineering), sophisticated crystallography (quasicrystals, incommensurate structures), thin films and nanocrystals.

There are, of course, a variety of journals dedicated to crystalline materials. A new journal must develop its own profile, which largely depends on the contributors. All usual formats of papers—communications, articles, reviews—are welcome and will be considered for publication after peer review. An exceptional advisory board has been put together, and further experts will be needed to select top-quality papers. Suggestions for special issues are also welcome, and, please, volunteer to become a guest editor. Help the members of the advisory board and me as the Editor-in-Chief to shape a forum for excellence on crystals in *Crystals*!

We look forward to learning about your eminent research and will be happy to provide an excellent open-access journal for rapid publication of crystal-oriented research, both for writers and readers.