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EDITORIAL

Editorial

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The Genesis and Evolution of the *Journal of Cluster Science*

Cluster science is an interdisciplinary field of study. There is much overlap between various disciplines of cluster science, from the traditional fields of chemistry, physics, biology, materials, and mathematics, to the new fields of nanoscience and nanotechnology. A multi-disciplinary approach, including interpersonal dialogue and close collaboration among scientists from different fields of science and technology, is crucial to, indeed the only way to foster, the further development of cluster science and technology. In 1989, one of us (BKT) approached Plenum Press to start a new journal devoted entirely to cluster science. The inaugural issue was published in 1990 with two co-editors, Prof. David H. Russell and Prof. Boon K. Teo. Over the years, the journal has experienced many changes, most of which were

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borne out of necessity and were for the better. First, the publisher had gone through several changes: Plenum Press's name changed to Plenum Publishing Corporation, then to Kluwer Academic, and now Springer. Second, following the departure of Prof. David H. Russell, both Prof. Richard D. Adams (first) and Prof. Charles M. Lukehart (second) joined as co-editors. Third, we have had the good fortune of the support of an excellent publishing team headed formerly by Amelia M. McNamara (who has since retired) and currently by Kenneth Howell. They have managed this journal with unmatched professionalism and exemplary efficiency. Most importantly, they share our vision and passion with regards to the mission and future development of the journal.

From the very beginning, our intention was to provide a forum for dialogue, and exchange of ideas, amongst scientists working in diverse fields of cluster science. This focus is emphasized in the journal title of *Journal of Cluster Science* instead of *Journal of Cluster Chemistry*. However, we must admit that, over the last 25 years, this journal has emphasized mainly on the cluster chemistry side, despite the fact that inclusion of cluster nanomaterial topics was added in 1998.

On the occasion of the journal's Silver Anniversary, we look into the future with the intention to diversify and broaden the journal scope and mission to better serve the growing scientific communities of cluster researchers.

*Journal of Cluster Sci*ence: Scope and Mission

Journal of Cluster Science is an international, interdisciplinary journal devoted to all cluster-related sciences. It publishes high-quality peer-reviewed original papers, communications, comprehensive reviews or short overviews, and commentaries, thus covering a broad range of topics in both basic and applied cluster sciences.

The term "cluster" is broadly defined as two or more nanosized or subnanosized objects "clustered together." Examples of nanosized objects include atoms, molecules, supermolecules like proteins or DNA; nanomaterials might be nanoparticles, nanowires, nanotubes, etc. Examples of subnanosized particles include electrons, quarks, protons, and neutrons. Clustering interactions may range from weak van der Waals or hydrogen bonds to strong chemical (covalent, ionic, or metallic) bonds to ultra-strong nuclear forces. The resulting clusters of interest may be 1-, 2-, or 3-dimensional, with the requirements that at least one of the dimensions must be smaller than 100 nm and the remaining dimensions preferably no greater than 250 nm.

The mission of the journal is to provide a platform for the publication of novel findings in cluster research and reviews of cluster science topics of current interest. It also seeks to foster the exchange of innovative or provocative ideas, and to encourage dialogue among researchers working in such diverse fields as chemistry, physics, mathematics and statistical analysis, computer science, biology, nanomaterials, astrophysics, astronomy, and earth science. As a journal focusing solely on clusters, the *Journal of Cluster Science* is perfectly situated to serve as a bridge between various disciplines of cluster sciences. In so doing, it hopes to facilitate the

birth of new cluster sciences and to promote the growth of existing or emerging fields or hybrid disciplines at the various interfaces of cluster sciences.

Expanded Scope

After 25 years, *J. Cluster Sci.* is now well established as a reputable journal in cluster chemistry. The present Silver Anniversary issue is a milestone in the history of the journal. In light of the recent explosive developments of cluster science in various scientific disciplines, it is now the time to expand the scope and mission of this journal.

The new and expanded scope includes, but is not limited to, the following:

1. Cluster Chemistry and Nanomaterials including main-group clusters, metal clusters, carbon- or silicon-based clusters, synthesis of molecular clusters, novel synthetic techniques for cluster growth and novel experimental techniques for cluster reactions, as well as structure determination, bonding analysis, chemical and physical properties of clusters (such as stoichiometric or catalytic reactivity, and dynamic processes). Other topics include clustering of atoms and molecules (reaction dynamics, spectroscopy, clustering on surfaces, and cluster interactions at interfaces); and self-assembly of clusters and nanoparticles (theoretical and experimental studies of clusters and nanoparticles of all phases, on surfaces, or at interfaces).
   Cluster materials may include nanomaterials, nanoparticles (where topics might include nucleation and growth of nanoclusters and nanocrystals, particle growth and morphology, particle surface passivation and size selection, particle phase transformations), catalysts (their synthesis, characterization, and applications), nanocomposites (such as core–shell particles, axial and radial heterostructures of metals, semimetals, semiconductors, insulators, and organic–inorganic-polymer multicomponent hybrid materials), 1-D, 2-D, or 3-D arrays of nanomaterials, cluster-assembled hierarchical nanomaterials, cluster-based quasicrystals and intermetallic phases, and cluster-based sensors and detectors.
2. Cluster Physics and Astrophysics includes topics such as quantum confinement, Coulomb blockade, tunneling, etc., of clusters or nanomaterials, physical properties of clusters (electronic, optical, magnetic, spintronic, or thermodynamic properties), gas-phase clusters, cluster beam, molecular or particle spectroscopy, single-particle (single-atom, single-electron, and single-photon) spectroscopies, transport properties (such as electrical and thermal conductivities, superconductors, superionic conductors, light transmission, energy transport, etc.), quasicrystals, intermetallic phases, nonlinear phenomena (such as nonlinear optical properties, optical limiter, etc.), and chaos.
3. Cluster Biology and Life Sciences includes, but is not limited to, molecular biology of clusters, cluster cell biology, cluster biochemistry, formation and transport of clusters in biology, biomimetics, genetic clusters, dendrograms, cladograms, structures of viruses, sequence analysis, genome annotation, cancer clusters, cluster-based biosensors, detectors, and diagnostics.

4. Cluster Mathematics and Analysis includes topics such as cluster statistical analysis, new mathematical clustering algorithms, novel theoretical/computational methods for cluster calculations, or mathematical modeling or calculations of cluster structures, interactions, or properties.
5. Cluster-related Earth Science includes such topics as cluster formation in nature and clay nanoparticles (synthesis, structure, and properties).
6. Articles related to cluster-based energy production (renewable, solar, fossil, biomass, etc.), conversion, storage, or transport and to the use of clusters in environmental sciences are also welcome.
7. New instrumentation or novel experimental techniques for cluster research.

Types of Manuscipts

The journal publishes the following types of papers: (a) original research *papers*; (b) authoritative comprehensive *reviews* or short *overviews* of topics of current interest; (c) brief but urgent *communications* on new significant research; and (d) *commentaries* intended to foster the exchange of innovative or provocative ideas, and to encourage and facilitate dialogs, amongst researchers working in different cluster disciplines.

From time to time, the journal also publishes thematic issues devoted to a particular topic of current interest or dedicated to a particular event (such as conferences or memorial issues). These special issues may be by invitation only.

Manuscripts must contain identifiable cluster elements or concepts. Manuscripts must exhibit sufficient novelty and adhere to international standards for format, scientific notation, and English usage. Routine or derivative papers will not be considered.