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Editorial

This past year has been a period of transition for *Cement and Concrete Composites*. In anticipation of the retirement of Prof. R.N. Swamy from the position of Editor, the Editorial team has acquired new members and a new organizational structure. Other notable changes include the Journal's current use of the Elsevier Editorial System as the preferred mode for manuscript submission and review. The change in authorship of this Editorial signifies yet another step in the transition process.

The success and achievements of the Journal have been due to the dedication and forward thinking of its Founding Editor, Prof. R.N. Swamy, and the valuable contributions of its authors, reviewers, and production team. Just as important, however, there has been a continuing need for research and innovation in the field of cement and concrete composites. As would be evident from most any sampling of its previous issues, the scope of the Journal covers a remarkably broad range of topics related to cement composites and their application within the built environment. Since its inception in 1979, the Journal has grown (in both content and the extent of its readership) by providing for timely coverage of topics of central importance, while also promoting topical breadth and a diversity of research backgrounds of the contributing authors. Special Issues of the Journal offer thematic and focused coverage of selected areas of research, and present opportunities for cross-disciplinary exchange of relevant information.

Although the recent organizational and operational changes are significant, they do not imply any major shifts from Journal's current emphases and stated objectives. The Journal will continue to interpret cement composite materials, in a broad sense, to include composites formed from various types of binders (e.g. hydraulic cements, polymeric resins, and supplementary cementitious materials) and various types of inclusions and/or reinforcing schemes (e.g. natural and synthetic aggregates, waste and recycled materials, short-fiber reinforcement, grid and textile reinforcement). The Journal's objectives include promoting a unified understanding of the materials science, engineering, and field applications of cement composites, and encouraging the development of environmentally sound materials and construction practices.

Cement and Concrete Composites tend to be hierarchically structured materials whose properties are affected by phenomena occurring over multiple length and time scales. As a further complication, there are strong interdependencies between material structure, processing methods, and the performance of the material in a structural setting, especially when it is subjected to severe environmental conditions and loads. Newly developed sensing techniques and diagnostic tools are being utilized to better understand the influences of constituent design and production processes on the fresh and hardened properties of the material. For many applications, there are significant differences between laboratory results and performance in the field due, in part, to the additional variability associated with field construction. Computational modeling is a promising means for supplementing limited test and field data, and enabling investigations outside the parameter range covered by physical experimentation. The utility of such numerical experimentation depends greatly on having appropriate, accurate model inputs and on model verification at all relevant scales. There is great potential for material and structural design through closely-coupled physical and numerical experimentation.

Construction and maintenance of the built environment consumes more materials than any other human activity, regardless of whether consumption is measured on a volume, weight, or cost basis. Cement and concrete composites are amongst the most extensively used construction materials. In many of the industrialized regions of the world, the infrastructure systems have degraded over time due to operational use and environmental stresses, such that they are increasingly in need of repair; other regions are experiencing periods of rapid new development. Predicting and/or extending service life is important for a variety of facilities, ranging from major components of the civil infrastructure (e.g. buildings, bridges, port facilities, dams) to structures in rural, developing regions of the world (e.g. agricultural storage units and affordable housing). Premature failures and the inefficient use of construction materials are unacceptable as major costs to society and the Environment. Life cycle design procedures account for the various costs accrued over all life stages of a facility. These procedures aim to reduce (or seek an appropriate balance between) economic and environmental costs, including costs related to materials and energy consumption, waste generation, emissions to the environment, and

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health effects. These cost considerations are motivating some of the research and development of novel processing methods, alternative binding materials, new forms of reinforcement, etc., for cement and concrete composite materials and structures.

The effectiveness of the Journal in providing a forum for these and other potential research topics depends mainly on the research activities of the prospective authors and the professional relationships between the authors, reviewers, and editors. Moving forward from this point in time, it is sincerely hoped that these parties will cooperate as partners, both in pursuing the overall objectives of the Journal and in directing its future course according to society's needs.