

EDITORIAL

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We are happy to introduce the first issue of the *Journal of X-Ray Science and Technology*. We are pleased with the initial results and hope that you, the reader, will find the Journal useful and interesting. As a novice editor it has been an education to experience the struggle that goes into producing a high-quality scientific journal. Having fathered 9 children, I find the experience not unlike the birth of a child. In the case of the Journal, however, I think I have more of the perspective of the mother. As with each of my children, the struggle was well worth it.

I am convinced that the community we seek to serve is in need of a journal like the *Journal of X-Ray Science and Technology*. At a time when there is great concern about the proliferation of new journals and when costs are forcing libraries to be selective in their choice of journals to be purchased, a new journal must be justified.

We feel that the *Journal of X-Ray Science and Technology* will fill an important need. We have listed below some of the primary reasons for our expending considerable effort to create this new periodical.

- A growing number of papers related to x-ray theory and practice are published each year. However, they are published in a wide variety of technical journals representing many diverse fields of science and technology. This is appropriate because the study of x rays is an important subfield of physics and the application of x-ray theory and x-ray instrumentation is important in almost every field of science and technology. However, as a result of this diversity many important papers and ideas are missed by a many members of the x-ray community. Thus the need for a journal which will bring under one cover the key papers on x rays that are appropriate for all researchers involved in the field or who may become involved in the study or use of x rays.

- In addition the field is growing rapidly, driven by fusion research, materials research, integrated circuit production, etc., and the development of new tools, e.g., storage rings, x-ray lasers, laser-produced x-ray sources, diffraction optics, array x-ray detectors, etc. This rapid growth demands a forum which presents a synthesis of the new developments that have general interest for all workers in the field, whether they are novices or veterans of x-ray related research. Those entering the field are handicapped by the fact that the literature is so diverse and by the fact that some of it is not widely distributed. We have seen the spectacle of new workers in the field presenting papers without a clue that the same work discussed was presented in the same forum one to three years previously. We hope this journal will provide a mechanism to reduce this frustrating duplication of effort.

- In the following decades we see important advances in x-ray sources, x-ray optics, x-ray detectors, and x-ray image signal processing with applications which will have major scientific, economic, and political impact on all parts of the world. This journal

is intended to serve as an international forum for technically sophisticated workers in this movement to interact both formally and informally. We hope this interaction will serve as a catalyst to accelerate and coordinate these advances to the benefit of all.

- During such a period of rapid growth, the major decision makers need a source of accurate, well-documented information on the current state of the field. They must have a credible background on which to base their decisions for future developments in the field. We hope the Journal will play a significant role in this process.

Our purpose is to provide an attractive, readable journal as a mechanism for meeting these needs. The success of the enterprise is the responsibility of the community we desire to serve. I have no doubt that these needs will be amply met if you in the x-ray community submit your best work for publication, provide thoughtful and fair reviews when requested, offer your comments and suggestions, and encourage your colleagues around the world to participate in the dialog.

A word about the title is appropriate. We are following a current trend by creating a journal that deals with both the science and the technology of a field of specialization. We feel that this is particularly appropriate in the field of x rays. Science and technology are synergistic in general, but in the field of x rays much of the current progress is driven by the development of technology. Previously, the scientific ideas in x rays far outstripped the technology necessary to perform the key experiments. That has now changed. To appropriately address the needs outlined above, the Journal must provide the best results in both areas. The papers presented in the first issue provide a validation of this fact.

The first issue includes a guest editorial and an invited review article that directly address this proposition. Each focuses on x-ray optics. Albert Baez helps put our scientific heritage in perspective by describing his ground breaking work in x-ray optics. Baez gives us a flavor of and appreciation for an earlier time in the study and development of x-ray optics. His discussion provides support for the opinion that many of the key ideas in x-ray optics have already been expressed, however, now that we have developed the technology to produce practical x-ray optical elements that were only dreamed of earlier. Nat Ceglio supports this assertion. He gives us a review article which presents much evidence for a revolution that is occurring in x-ray optics. He describes some interesting new devices as part of this evidence. He also discusses some of the exciting applications that may have enormous economic impact. One of these is x-ray lithography which has long been hailed as the next great boon to semiconductor production. Despite disillusionment by some of the semiconductor companies, Nat argues that recent advances in x-ray optics and sources may provide the key to make this technology practical. In addition, we have an excellent paper on x-ray interferometry which describes a scanning interferometer. There is also a paper describing an interesting x-ray source based on a micropole undulator. There is a study of multilayer x-ray reflectors subjected to damaging x-ray fluxes. We are sure you will find these papers interesting and useful. We also hope they will stimulate you to contribute your own fine work.