

Editorial

X-Ray Lasers

Since the first demonstration of lasing in the X-ray region eight years ago major progress has been made world-wide in the field of X-ray laser research. A multitude of gain lines down to wavelengths as short as 3.6 nm have been reported and – at longer wavelengths – gain saturation has been achieved. Coherence properties of the generated X-ray beams are being addressed. Furthermore, applications of X-ray laser beams not only in the water window (2.3–4.4 nm) but also at longer wavelengths are emerging.

In a field this active the excellent response to Applied Physics' call for papers for a feature issue on X-ray lasers was exciting but certainly not surprising. As for a previous feature issue on X-ray lasers of this journal (Applied Physics B 50, 1990), it has been necessary to split the papers into two parts, with about half of them appearing in the present issue and the remainder later this year.

In between two X-ray laser conferences (Schliersee 1992 and Williamsburg 1994) this feature issue represents a most welcome survey of what is currently happening in the field of X-ray lasers. It shows the continuing efforts towards a table-top X-ray laser, on which remarkable progress is being made. Progress in both collisional and recombination X-ray lasers is presented. Furthermore, an improved understanding of previously observed anomalies and discrepancies between experiment and theory is evolving. Based on the availability of ultra-short-pulse pump lasers, new ideas which may eventually lead to a table-top water-window X-ray laser are put forward.

It may also be noted that in feature issues like this one, the continuing world-wide cooperation in the field of X-ray lasers combining the efforts of many laboratories becomes evident.

As the guest-editor of this issue, I should like to thank all contributors for their efforts and care in preparing their manuscripts. Thanks go to Springer-Verlag for taking the initiative and performing the task of preparing these issues of Applied Physics B, to represent recent progress in the field of X-ray lasers.

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