

Abstract for invited talk by Rob Eason.

Progress in ferroelectric domain engineering at the micro/nanoscale

Lithium niobate is an extremely versatile single crystal material that finds numerous optical and optoelectronic device applications in the fields of electro-optics, nonlinear optics via quasi-phase-matched periodic poling, piezoelectrics, and optical MEMS. As with all other materials technologies, structuring at the micro/nanoscale opens up a wide range of further device possibilities which are inherently unavailable for the material in its bulk form, and hence microstructuring of such nonlinear optical hosts has attracted much attention recently.

In this talk I will describe recent progress and problems associated with our current microstructuring work, illustrating the range of possibilities now available to us through manipulation of both the topology and ferroelectric domain structure at the micro/nanoscale border. Applications discussed will include domain structuring using optical and UV laser light, surface modifications for enhanced frequency conversion processes, and optical waveguide formation with simultaneous periodic domain inverted regions. The talk will conclude with a perspective for future directions in ferroelectric crystal engineering.