Dr Wigen Nazarov
Research Fellow

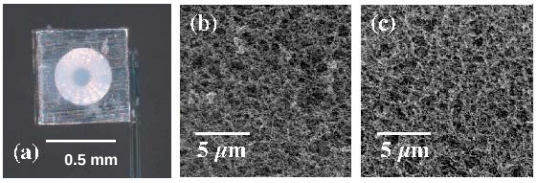
e-mail: wn9@st-andrews.ac.uk
Tel: 01334 463815

Research Interests:

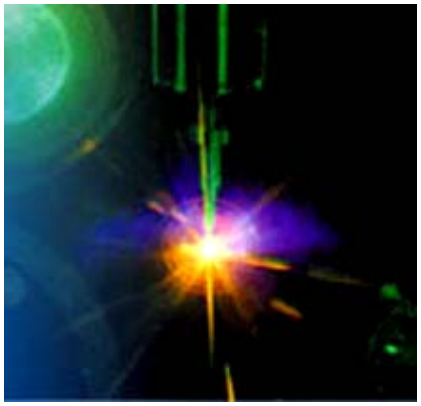
Very low density micro and mesoporous polymeric foams using photo-initiated monomers. Low density polymeric foam films, carbonized micro and mesoporous foam systems, foams containing high percentage of homogeneously dispersed high Z elements and metallic foams.

Small scale ***in-situ*** polymerisation technique is used to produce size foam-filled laser targets using photo-initiated monomers. These small targets containing low density foams are utilised in high energy laser experiments carried out in a number of laboratories throughout the world. Experiments are designed to study the interaction of high energy lasers with low density materials. The results from these high energy laser physics experiments are important first step into the production of future fusion energy. Interaction of high energy laser with matter produces plasma which could be utilised in future fusion energy plants, with all the benefits and none of the harmful by-products of the fission reactors. Fusion is the energy produced by the sun. Foam-filled targets produced for high energy laser physics experiments are highly specialised with rigorous specifications on density, uniformity, composition and structural properties.

Collaboration with international laboratories include: Lawrence Livermore National Laboratory (USA), Los Alamos National Laboratory (USA), University of Milan (Italy), STFC (Rutherford Appleton Laboratory, Central Laser Facility, UK), University of Rochester (Laboratory for Laser Energetics, USA), University of Prague (Czech Republic), LULI polytechnique (France) and Lebedev Institute of Physics, Russian Academy of Sciences (Moscow). I am currently involved in research and development of low density polymeric (and co-polymeric) foams, containing a high percentage of pure elements and halogens for the experiments scheduled in 2012 on the next generation of high energy lasers in UK (project ORION) as well as other high energy laser experiments globally.



3 mg/cc Density foam made *in-situ* for experiments on High Energy lasers (a) laser target; (b & c) SEM of Foam inside target



High energy laser interacting with a target

SELECTED RECENT PUBLICATIONS

1. Title: Laser-driven plasma jets propagating in an ambient gas studied with optical and proton diagnostics
   Author(s): Gregory, CD; Loupias, B; Waugh, J, et al.
   Source: PHYSICS OF PLASMAS Volume: 17 Issue: 5 Article Number: 052708 Published: 2010

2. Characterization of High-Intensity Laser Propagation in the Relativistic Transparent Regime through Measurements of Energetic Proton Beams; Willingale, L; Nagel, SR; Thomas, AGR, Nazarov, W et al., **PHYSICAL REVIEW LETTERS** Volume: 102, Issues:12, Article Number: 125002 , 2009

3. Astrophysical jet experiments; Gregory, CD; Loupias, B; Waugh, J, Nazarov, W, et al., 35th European-Physical-Society Conference on Plasma Physics, **PLASMA PHYSICS AND CONTROLLED FUSION** Volume: 50 Issue: 12, Article Number: 124039, 2008

4. Laser-driven proton beams: Acceleration mechanism, beam optimization, and radiographic applications; Borghesi, M; Cecchetti, CA; Toncian, T, Nazarov, W, et al., **IEEE TRANSACTIONS ON PLASMA SCIENCE** Volume: 36 Issue: 4 Pages: 1833-1842, 2008