



OptIC Technium®

CENTRE FOR MODERN OPTICS

Pioneers in Holography and Optical Nano-lithography



OptIC Technium
Ffordd William Morgan
St Asaph Business Park
St Asaph
Denbighshire
North Wales
LL17 0JD
United Kingdom

Tel: +44 (0) 1745 535 100
Fax +44 (0) 1745 535 101

INTRODUCTION

The Centre for Modern Optics (CMO) has a worldwide reputation for its work in full colour holography, holographic materials, HOEs, diffusers, projection screens, 3D imaging, interferometry and the development of lasers and other photonic devices.

CMO transferred from De Montfort University to the state of the art facility at OpTIC which is located at the heart of the renowned opto-electronic cluster in North Wales. The relocation and recreation of the CMO group at OpTIC is designed to optimise the scientific strengths and to take advantage of the commercial exploitation capabilities at OpTIC. It is anticipated that this will put CMO at the forefront of the major expansion of holography and lithography over the coming years.

CMO builds on more than 20 years experience in holography and coherent optics. Our unique history of contract research and consultancy in many important aspects of physical optics and optical imaging has resulted in successful break through developments in diffusers, phase plates, barrier masks, projection screens, HOEs for 3D displays, full colour display holography and novel holographic materials.

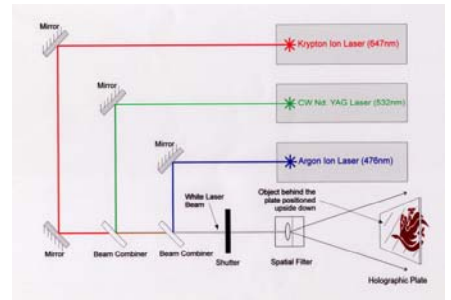
Our current completed work includes:

- Development and testing of Holographic and lithographic materials
- Fabrication of photonic bandgap materials
- Production research on the mass fabrication of diffusers and projection displays
- Computer-generated amplitude holography by optical lithography
- Parallax barriers for three-dimensional displays
- Research on the manufacture of HOEs for three dimensional displays.
- Full colour display holography
- Optical speckle and holographic security
- Lippmann photography for security applications
- Calculation of computer-generated holograms for liquid-crystal displays
- Holographic microscopy for analysis of drug precipitation

CMO SERVICES

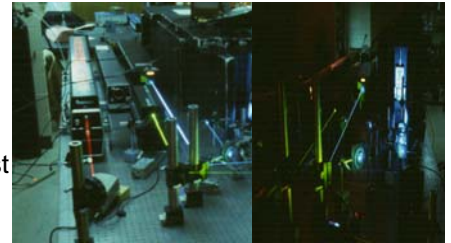
1. Developed processes in all aspects of holography including

- Holographic materials
 - Silver Halide emulsions
 - Dichromated Gelatine (DCG)
 - Photo Resist
 - Novel Polymers
 - Photopolymer – Monochrome & Panchromatic
 - Thermoplastics
 - Bio pigments
 - Photo refractive crystals and polymers
- Full parallax colour 3D display holography
- Volumetric and embossed holography
- Digital and computer generated holography
- Holographic Optical Elements (HOEs) for
 - Three-dimensional image displays
 - H Holographic reflectors
 - Fine gratings
 - Optical telecommunications



The recording for full colour applications is performed with 'white' Laser light, using Krypton Ion 647nm, CW Nd YAG 532nm and Argon Ion 476nm.

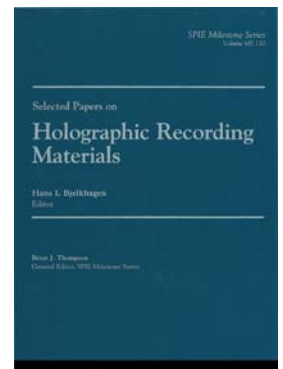
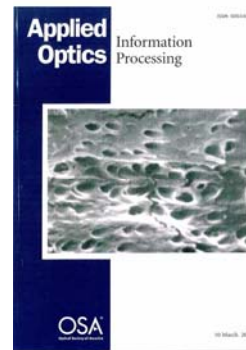
In comparison to any other currently available imaging technology, The virtual image produced in colour holography represents the most realistic image of an object that can be recreated.



2. Study and development of new Recording

materials

- Current and novel recording materials for holography and lithography
- Unconventional and conventional photo-polymers
- Super hard gelatine structure that can be endowed with blue, green and red holographic sensitivity.



3. Developing auto-stereoscopic 3D screens

Parallax barrier screens and holographic optical elements have both been used for 3D systems. Such systems provide the viewer with a high-quality 3D image without the need for any type of eyewear.

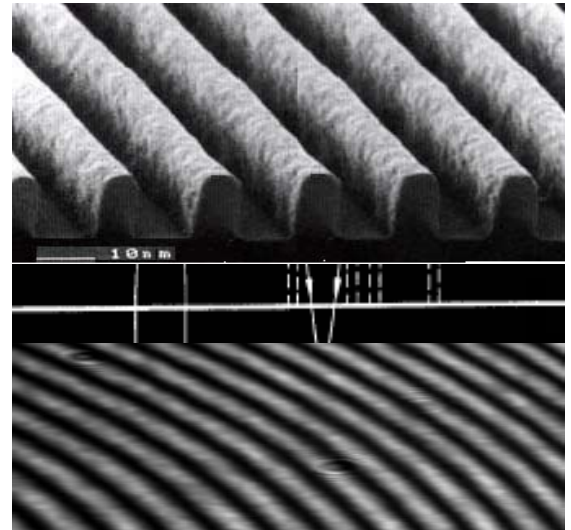


4. Development of Nano-lithographic processes

Using lithography, we can create holograms, diffusers, large projection screens (up to 2mx1.4m) and asymmetric masks of precise uniformity and contrast.

Lithographic technique applications are:

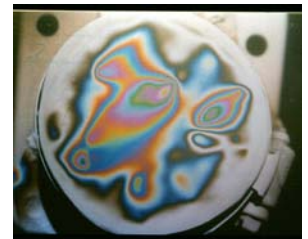
- diffusers
- volumetric and light shaping diffusers
- micro lenses
- phase plates,
- barrier and asymmetric masks,
- LCD back light
- large rear and front projection screens
- computer generated holograms



Solutions have been found to control speckle size, fast beam switching with continuous scanning, contact copying, new polymer and high resolution mask making material, high speed writing of large areas of individually exposed pixels, precision flat bed mover apparatus, new software and hardware.

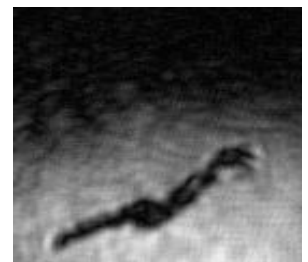
5. Providing vibration measurements using holographic interferometry

Using a multi wavelength interferogram is a convenient way of measuring vibrations and deformations



6. Digital holographic microscopy

Digital holographic microscopy, is ideal for online image crystallisation. It provides high resolution, 3D information with only a single snapshot needed to reconstruct information for a range of depths through the sample.



7. Full document security based on OVD (Optical Variable Device) and Lippmann photography

Lippmann photography can be used to provide a unique document security device where a high degree of security is needed, being virtually impossible to copy.



FACILITIES

The facility is capable of supporting the foreseeable work program without the need for significant change. Our resources are considerable.

Rooms	Facilities/Equipment
Five Fine Optics Labs	<ul style="list-style-type: none">• Vibration isolation• Independent air handling system• Acoustic noise blocking wall• Clean room conditions• Laser safety interlock (monitoring) system• Dimmer light & photographic safety light• PA (pressured air)• Closed cooling water system (20 micron)• Air purifier• Raised access floor• Various lasers and optics• Measurement/Analysis equipment• Emergency air extraction system
Three Dark rooms	<ul style="list-style-type: none">• CW and deionized water supply systems• Waste water processing (filter) systems• Processing sinks & drainage for waste water and chemicals• Dimmer light & photographic safety light• Fume extraction systems• Independent air conditioning system
Chemical Storage	<ul style="list-style-type: none">• Independent air extraction system (Solvent, Acid)• Emergency air extraction system• Hazardous chemical storage cabinet• Shelves (stainless steel / non-erosive)
OpTIC Technium Measurement/Analysis Centre	<p>Various measurement/analysis equipment e.g</p> <ul style="list-style-type: none">• Microscopy• Interferometry• Spectroscopy• etc
Utilities	<ul style="list-style-type: none">• Electrical transformers• Enclosed cooling system• Electricity (408/380V 3p Y & delta connection)• Electricity (220/110V 3p & 2p)• Pumps and water purifying system• N2, N2P (filtered and pressured nitrogen gas for purge)

KEY PERSONNEL



Hans I. BJELKHAGEN, MSc, PhD (Industrial Metrology), Fellow SPIE, Fellow RPS, Accredited Senior Imaging Scientist RPS

Tel: +44 (0) 1745 535 130
Fax +44 (0) 1745 535 101
E-mail hans.b@optictechnium.com



Ardie OSANLOU GDip, MPil, PhD, TCFAE, CMath, MIMA


Tel: +44 (0) 1745 535 131
Fax +44 (0) 1745 535 101
E-mail ardie.o@optictechnium.com



Nicholas J. PHILLIPS ARCS, FInstP, CPhys, FRCA, Emeritus Professor of Physics Loughborough

Tel: +44 (0) 1745 535 132
Fax +44 (0) 1745 535 101
E-mail nick.p@optictechnium.com

LOCAL LOCATION DIRECTIONS





Technium®
OpTIC

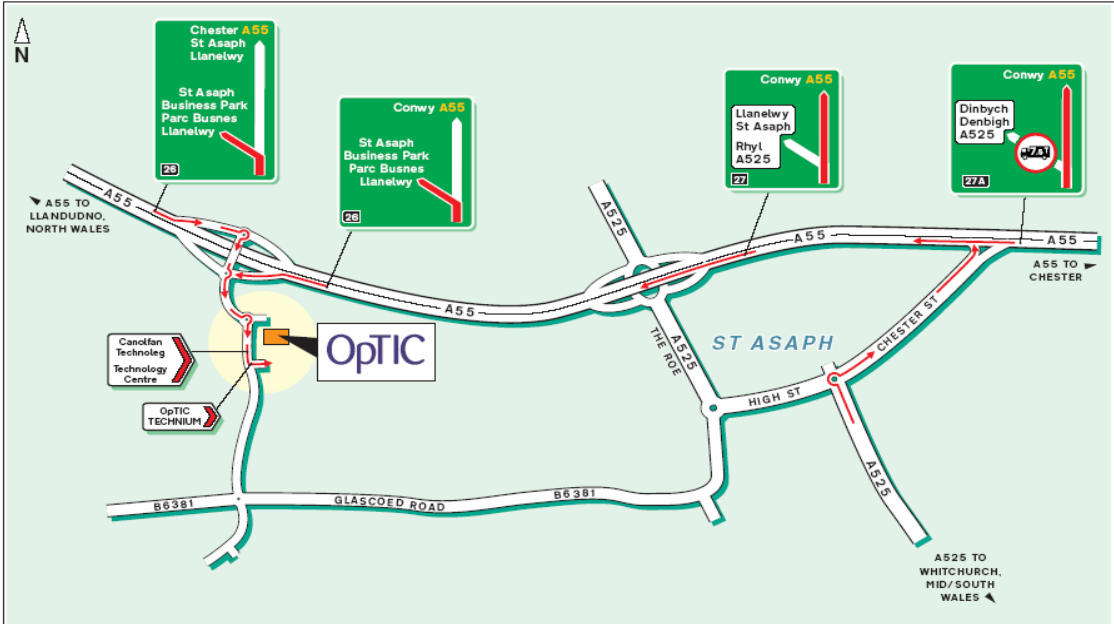
OpTIC Technium
Ffordd William Morgan, St Asaph Business Park,
St Asaph, Denbighshire LL17 0JD

Tel: +44 (0)1745 535100 Fax: +44 (0)1745 535101 Email: info@optictechnium.com Web: www.optictechnium.com

Public Transport

 **By Rail, Rhyl Station.**
Take a taxi from outside the station to our office.
Journey time approximately 10 minutes.

 **By Air, Manchester International Airport.**
Approximately 1 hours drive away.
Liverpool John Lennon International Airport.
Approximately 1 hours drive away.



© Give Way 2004. Tel: 0800 019 0027. Crown Copyright. PU 100040256. Mapping powered by Ordnance Survey