



The  
University  
Of  
Sheffield.



The  
University  
Of  
Sheffield.

Department  
Of  
Chemistry.



# Our MSc in Polymers for Advanced Technologies.

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“I chose to do my MSc at Sheffield for many reasons, including the city life, its proximity to the Peak District and the academic quality of the University. However, the main reason was the University’s international reputation in Polymer Science.”

Fumico Chibba  
Graduate 2005 (Japan)

### What if English isn't my first language?

Our standard English requirements for overseas applicants are: IELTS 6.5 (with no less than 6 in each part), or TOEFL 575 with TWE 4.5 (paper based) or TOEFL 232, TWE 4.5 (computer based) or equivalent.

### How to apply

#### Online

This is the quickest and easiest way to apply. For details visit:

[www.sheffield.ac.uk/postgraduate/taught/apply](http://www.sheffield.ac.uk/postgraduate/taught/apply)

#### By mail

If you didn't receive a form with this brochure, you can download one from the website (above). Return your completed form and all supporting documents to:

PG Admissions Section  
Student Services  
9 Northumberland Road  
Sheffield S10 2TT  
UK

#### Contact

If you have any questions or would like to know more about our courses, please contact:

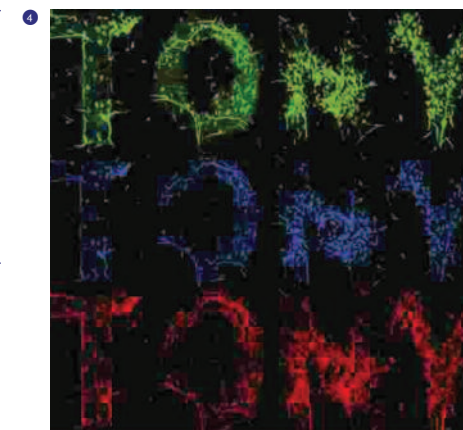
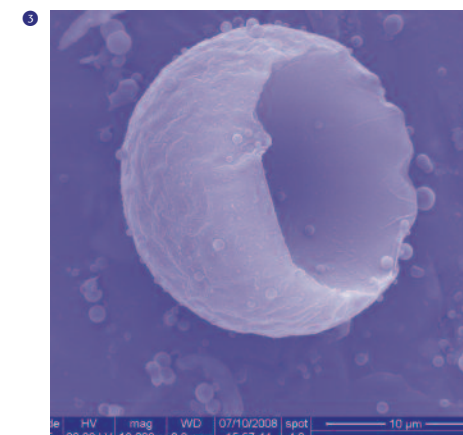
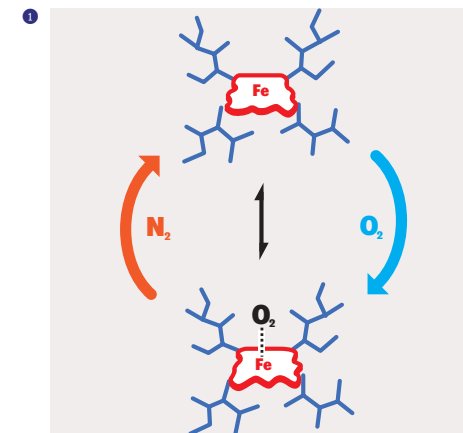
Polymer MSc Admissions Secretary  
The Polymer Centre  
Department of Chemistry  
University of Sheffield  
Brook Hill  
Sheffield S3 7HF  
UK

T: 0114 2229537

E: [polymersmsc@sheffield.ac.uk](mailto:polymersmsc@sheffield.ac.uk)

#### Research projects by department staff

- 1 'Plastic Blood': a synthetic analogue of haemoglobin which reversibly binds oxygen within a porphyrin containing polymer.
- 2 Electroluminescence emitted by a series of different conjugated-polymer light emitting diodes.
- 3 Core shell research with implications for the 2004 Stardust space mission that visited comet P81/Wild 2.
- 4 Identity label made by taking skin cells from the leg of Professor Tony Ryan and growing them on a surface generated by a plasma polymerisation procedure.



### *Polymer science: the future*

Polymers are all around us. They are used in coatings, films, fibres and electronic components and exotic materials of all kinds. They also have many applications in the biological and medicinal sciences in areas as diverse as soft contact lenses, plastic blood, wound dressings and artificial hip joints.

The use of polymers in industry is increasing. Companies need graduates with an appreciation of polymer science and the ways in which polymers can be used to develop new products and processes. If you have a chemistry, physics or engineering degree, this course can give you the right training in these areas.

Our MSc in Polymers for Advanced Technologies is designed to equip you with the knowledge and skills to contribute to new and exciting developments in this field. You will develop in-depth technical knowledge and expertise in your chosen polymer field. The course will also provide you with excellent analytical and research skills, as well as enhancing your project planning and project management skills.



### *A world-class place to study*

Our MSc in Polymers for Advanced Technologies is taught by members of the University of Sheffield Polymer Centre. The Centre is an internationally renowned multidisciplinary unit with 150 expert academics and research scientists from different departments across the University of Sheffield.

The Polymer Centre works on topics at the forefront of polymer science and engineering and the application to polymers in many new and exciting areas – from batteries to visual displays, molecular machines to aircraft wings and genetic engineering to drug delivery and tissue replacement. More information can be found on the Polymer Centre website [www.polymercentre.org](http://www.polymercentre.org)



### *Research excellence*

The MSc is delivered by staff in the Departments of Chemistry, Physics and Engineering Materials. In the most recent Research Assessment Exercise each of these departments scored highly. Over 90 per cent of their research was considered to be of international quality.



MSc Course Directors and Admissions Team



Professor Tony Ryan OBE  
Pro-Vice-Chancellor for the Faculty of Science



The Dainton Building where the Chemistry Department is based

### *Links with industry*

The Polymer Centre has significant interactions with a large number of industrial companies. The MSc benefits from this strong collaboration and in the past a number of companies have sponsored MSc research projects. More information can be found on the Polymer Centre website [www.polymercentre.org](http://www.polymercentre.org)

### *Your future*

Our graduates go on to fill key posts as polymer chemists and materials scientists in academia, industry and research. Many of our graduates go on to develop their interest in polymer science and begin PhD programmes.



### Course content

Our MSc in Polymers for Advanced Technologies aims to train, or retrain scientists for a variety of careers in polymer science and polymer related fields. The course covers a broad range of polymer topics including synthesis, modification, characterisation of polymers, polymer properties, behaviour and applications.

Throughout the course you will learn how to search and manage a variety of sources for scientific data and research results. In addition, you will also be taught how to present research results through a variety of media. One of the key aims of the course is train you in the specific laboratory skills required for polymer science. This is achieved through traditional laboratory classes and during the project, when you will become a fully integrated member of a research group.

Teaching is carried out by academic staff from Chemistry, Engineering Materials and Physics – many of whom are international leaders in polymer science. Pastoral care is provided by the course tutors and general help and advice is always available from the administrative staff in the Polymer Centre office (located in the Chemistry Department).

### Course content and structure

The degree course consists of 180 credits. This is made up of 120 taught credits and a 60 credit research module. The taught material is broken down into six 15 credit modules, each consisting of between 24 and 30 lectures. All modules are supported by workshops and tutorials. As well as being assessed by formal exams, these modules also contain coursework, which goes towards the final assessment of each module. The remaining two 15 credit modules, *Research and Presentation Methods* and *Polymer Laboratory*, are assessed entirely by coursework or continuous assessment.

The MSc course lasts for twelve months and is split into two roughly equal teaching semesters.

#### Semester one

The first semester contains core modules which are designed to introduce the basic concepts of polymer synthesis, polymer technology and biological polymers. Laboratory skills and essential research tools are also taught during this semester. Core modules include:

- Fundamental Polymer Chemistry
- The Physics of Polymers
- Biopolymers and Biomaterials
- Polymer Characterisation and Analysis
- Polymer Laboratory
- Research and Presentation Methods (assessed over both semesters)



#### Semester two

During the second semester you have a choice of modules. This allows you to specialise in one or more research areas of polymer science. You choose two advanced modules from the following and an extended research project.

- Polymers of Controlled Structure
- Biomedical Applications
- Smart Polymers and Smart Materials
- Macromolecules at Interfaces
- Polymer Fibre Composites
- Electronic Molecular Materials and Devices

During this semester you also have the opportunity to undertake an extended research project. Once again you are able to select a project based on your particular skills and interests (i.e. synthetic, analytical or technology based project). A brief selection of recent project titles (and supervisors) is given below. For more information on our research interests see the relevant staff pages on the chemistry website: [www.sheffield.ac.uk/chemistry/staff](http://www.sheffield.ac.uk/chemistry/staff)

*“The MSc Polymer course at Sheffield was recommended to me by my professor back home in Greece, who said that Sheffield is one of the best places in the world to study polymers. Sheffield is a very friendly city, where it’s easy to find anything you need and do everything you want. I originally planned to stay and study for just the MSc, but the environment and camaraderie between staff and students encouraged me to stay on and do a PhD.”*

Nikos Nikgeorgos  
Graduate 2007 (Greece)

- *Synthesis of biocompatible polymer brushes via surface ATRP* (supervisor Professor S Armes)
- *Synthesis and micellar self-assembly of zwitterionic block copolymers* (supervisor Professor S Armes)
- *Polyamidoamines as inhibitors for protein-protein binding* (supervisor Dr L Twyman)
- *Smart polymers* (supervisor Dr L Swanson)
- *Development of conjugated polymers for application in solar cells* (supervisor Dr A Iraqi)
- *Phase transitions in polymers* (supervisor Professor A Ryan)
- *Photochemical fabrication of molecular scale chemical gradients for studies of macromolecular diffusion* (supervisor Professor G Leggett)
- *Development of high throughput methodologies for polymer characterisation* (supervisor Dr P Fairclough)

#### Assessment of modules

Most modules are assessed by an end of semester exam. All modules contain at least 25 per cent course work. Other modules, such as Polymer Laboratory and Research and Presentation Methods are assessed entirely through coursework. The research project is assessed by examination of a final thesis.



Top: Botanical Gardens  
Below left: Chatsworth House  
Below right: The Information Commons



### *Our city*

Sheffield is England's fourth largest city. It is located roughly in the middle of England, on the edge of the Peak District National Park, about two hours by train from London. The atmosphere is laid-back, but friendly. The city is compact and easy to get to know.

Although Sheffield is a major city, and developing all the time, it has kept its sense of community. This is a friendly, safe and affordable place to make your home. Here you can enjoy a sophisticated, fast-paced city life and be in the middle of beautiful countryside in 20 minutes.

### *Our University*

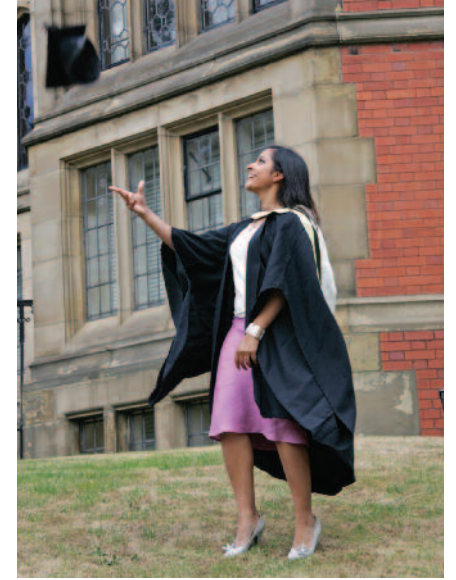
Founded in 1905, the university has grown in reputation and size to become one of the UK's best universities with a global reputation as an international leader in teaching and research. Today, the University of Sheffield is a premier-league, research-led institution with 24,000 students including over 4,000 international students from 130 countries.

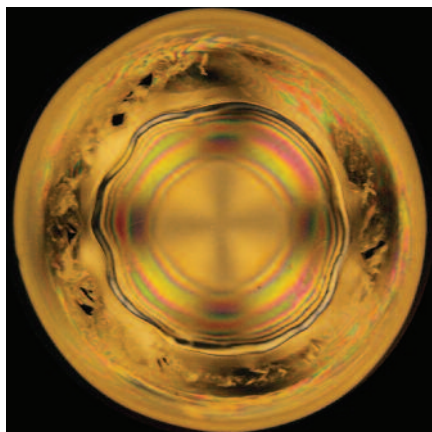
The University has produced five Nobel Prize winners, and many of our alumni have gone on to hold positions of great responsibility and influence around the world. A University of Sheffield graduate degree is a real investment in your future. The University reaffirmed its position at the forefront of multi-disciplinary research with the opening of a new £20 million research complex, the largest in the UK. This is home to the Kroto Institute for Materials Science, and the Nanoscience and Technology Centre.

## One of the cheapest cities in the UK to live and study

Natwest Student Living Index 2008

## England's greenest city with 150 woodlands and 50 public parks





Above: Polarized light image of low-density polyethylene taken after shear-induced crystallization.



### *Fees and funding*

Details regarding fees and potential funding change from year to year. For the most up to date information please visit the universities Taught Postgraduate web page, [www.sheffield.ac.uk/postgraduate/taught](http://www.sheffield.ac.uk/postgraduate/taught) and follow the relevant links. If you're applying from overseas you will find additional information on the universities *International* web page at [www.sheffield.ac.uk/international](http://www.sheffield.ac.uk/international)

From time to time the University and other related organisations advertise grants and scholarships that may be suitable for eligible students. For more information visit: [www.sheffield.ac.uk/pgresearch/studentships](http://www.sheffield.ac.uk/pgresearch/studentships)

### *What qualifications do I need?*

An honours degree in pure or applied Chemistry, Chemical Physics, Chemical Engineering, Polymer Science, Materials or a related subject. If you don't have an honours degree, but have equivalent qualifications or related experience, we encourage you to apply. We will consider each application on the basis of academic merit and relevant experience.

Although there is no formal deadline for applications, we would suggest that you aim to have your application in by the end of June (if applying to start the following September). If you are applying from overseas you should also allow time for visa applications.