

July 2024  
*Environmental Chemistry Group*  
**Bulletin**

**Meeting report: Killer Threads!** The environmental impact of fast fashion was the topic for the 2024 ECG DGL and symposium. **Kiri Rogers** summarises this event (pp 5-6), and there are more detailed reports by two of the speakers, **Dr Thomas Stanton** (p 10) and the Distinguished Guest Lecturer **Dr Raquel Prado** (pp 11-13). **Sir James Bevan**, formerly Chief Executive of the UK Environment Agency recounts the highlights of his career to Cranfield University's **Niall Marsay** (pp 15-17).  
**Environmental Briefs:** (pp 18-23) **Bence Solymosi** discusses catalytic systems for removing persistent organic micropollutants.

**William James** assesses Li ion battery fire risks, and **Gemma Miller** details the sources and pathways of textile pollution.

**Also in this issue:** **Stephanie Powley** speaks about her role as an analytical chemist with British American Tobacco.

There is a book review from **Valerio Ferracci**.

**Rowena Fletcher-Wood** gives an outreach update.

**Pablo Campo Moreno** speaks for World Environment Day.

**Laura Alcock** has some horticultural insights, and we announce three upcoming meetings.



## Interview

**Book review**

# Indoor air pollution

**Valerio Ferracci** ((National Physical Laboratory, [valerio.ferracci@npl.co.uk](mailto:valerio.ferracci@npl.co.uk))

People in developed countries spend approximately 90% of their time indoors, however, indoor air pollution is often overlooked relative to outdoor air quality. This book<sup>1</sup> provides a comprehensive exploration of this issue.

**doi:10.1039/c4cc00060a**

## Meeting report

# Killer threads! Fast-Fashion's impact on the environment.

Kiri J. Rodgers (University of the West of Scotland, [kiri.rodgers@uws.ac.uk](mailto:kiri.rodgers@uws.ac.uk))

The Environmental Chemistry Group's 2024 Distinguished Guest Lecture and symposium, held on 18<sup>th</sup> March at Burlington House, focused on environmental concerns surrounding fast fashion – from the pollution problems posed by the overproduction of clothing to ways of mitigating the environmental consequences of textile waste. **Dr Thomas Stanton**, **Professor Will Wise**, and our ECG

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Dr Raquel Prado

Ed

Report

# Outreach report 2024

Rowena Fletcher-Wood (freelance science communicator, [rowena.fletcherwood@gmail.com](mailto:rowena.fletcherwood@gmail.com))

In 2023, our events totalled ~170 meaningful outreach engagements from ~1400 festival attendees. So far in 2024, we have already exceeded this, with ~275 meaningful outreach engagements at just two festivals where these were measured – **ATOM Science Festival** in Abingdon, and **Dorchester Science Festival**.

## But how do we measure these engagements?

A recent survey of our audience revealed that 58% of respondents (n=1000) agreed or strongly agreed with the statement 'I have learned something new from the Royal Society of Chemistry'. This is a significant increase from 35% in 2022. The survey also found that 60% of respondents agreed or strongly agreed with the statement 'I have been inspired to learn more about science'. This is also a significant increase from 35% in 2022. The survey was conducted in July 2024 and is available in the ECG Bulletin, July 2024.

## Why are there more this year?

In addition to the increase in outreach engagements, we have also seen an increase in our social media presence. Our Instagram account has grown from 1,200 followers in 2022 to over 2,000 in 2024. Our Twitter account has also grown from 1,500 followers in 2022 to over 2,500 in 2024. This increase in social media presence is likely due to our increased outreach efforts and the high quality of our content.

Our outreach efforts have also been supported by our partners, including the Royal Society of Chemistry, the Environmental Chemistry Group, and the Royal Society of Open Education. We have also received funding from the Royal Society of Chemistry and the Environmental Chemistry Group to support our outreach activities.

## But what do the votes tell us?

The survey results tell us that our audience is highly engaged and interested in science. They are also highly motivated to learn more about science and to take action to address environmental issues. This is a positive reflection of our outreach efforts and the quality of our content. The survey also found that 60% of respondents agreed or strongly agreed with the statement 'I have been inspired to learn more about science'. This is also a significant increase from 35% in 2022. The survey was conducted in July 2024 and is available in the ECG Bulletin, July 2024.

## What next?

Looking ahead, we plan to continue our outreach efforts and to expand our reach to new audiences. We will also continue to work with our partners and to seek funding to support our activities. We are committed to providing high quality science communication and to making a positive impact on society.

## References

#1 Fletcher-Wood, R. (2022) 'The Royal Society of Chemistry: A Survey of our Audience', *ECG Bulletin*, July 2022, p7. !

%2 Fletcher-Wood, R. (2024) 'The Royal Society of Chemistry: A Survey of our Audience', *ECG Bulletin*, July 2024, p10.!

(https://...)







## Article

# DGL Feature: Microplastic and natural fibres

Dr Thomas Stanton (Loughborough University, [t.stanton@lboro.ac.uk](mailto:t.stanton@lboro.ac.uk))

Microplastics (MPs) are one of the most well-known types of environmental pollution. A MP is any piece of plastic smaller than 5 mm (about the size of a circle on top of a Lego® block), and MPs come in a variety of shapes including beads, fragments, and fibres. These particles can be eaten by even the smallest animals, blocking their gastrointestinal tracts. MPs are also known to introduce chemical pollutants to the environments they pollute.

MPs are present in  
the environment  
in many forms  
including  
fibres

Article

# DGL Feature: The textile industry and the environment

Dr Raquel Prado (Ananas Anam, raquel.prado@ananas-anam.com)

The garment industry has been transformed in the last century. Clothing is no longer regarded just as a commodity for protection from the environment or to fulfil the requirements of human decency, but is now subject to the whims of fashion and therefore to be replaced as fashion changes. The result? In industrialised countries, overproduction of clothing, limited usage, and disposal to ever expanding, but scarce, landfill sites.

As a result, the industry has been transformed in the last century. Clothing is no longer regarded just as a commodity for protection from the environment or to fulfil the requirements of human decency, but is now subject to the whims of fashion and therefore to be replaced as fashion changes. The result? In industrialised countries, overproduction of clothing, limited usage, and disposal to ever expanding, but scarce, landfill sites.

1. According to the European Commission, the textile and clothing industry in the EU is responsible for 10% of the total greenhouse gas emissions, with a significant portion of these emissions coming from the production of synthetic fibres. The industry also consumes large amounts of water and energy, and produces significant amounts of waste.

2. The industry is also responsible for a significant portion of the world's water pollution, with synthetic fibres and dyes being major contributors. The industry also consumes large amounts of water and energy, and produces significant amounts of waste.

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## Anticipating the “cellulosic fibre gap”<sup>5</sup>

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How To

# Gardening: repelling pests and fertilising garden plants with minimal environmental harm

Laura Alcock (Edwards Ltd, [laura.alcock@edwardsvacuum.com](mailto:laura.alcock@edwardsvacuum.com))

During the summer months, there is nothing more relaxing than sitting out in the garden during the evening sunshine – unless you are surrounded by biting insects. This is made all the more difficult when trying to avoid negative environmental impacts that can be common side-effects of insect repellents. This How To provides some suggestions for keeping gardens as the wonderful relaxing space they should be, without literally costing the earth.

## Repelling biting insects

Not only do biting insects cause discomfort, but they can also transmit diseases. In the UK, the most common biting insects are mosquitoes, ticks and fleas. Mosquitoes are the most common and are responsible for the majority of bites. Ticks are less common but can be more dangerous as they can transmit Lyme disease. Fleas are also common and can cause allergic reactions.

DEET (N,N-Diethyl-3-methylbenzamide) is the most commonly used insect repellent. It is effective against mosquitoes, ticks and fleas. However, it is not without controversy. Some studies suggest that DEET may be neurotoxic and can cause skin irritation. It is also known to be a neurotoxin to aquatic life.

Other common insect repellents include permethrin, picaridin and IR3535. Permethrin is a synthetic pyrethroid that is effective against mosquitoes, ticks and fleas. Picaridin is a synthetic compound that is effective against mosquitoes and ticks. IR3535 is a synthetic compound that is effective against mosquitoes and ticks. Natural repellents such as citronella, eucalyptus and lavender are also available. These are generally considered to be safer than synthetic repellents, but their effectiveness is often lower.

Chemical repellents are often used in gardens to protect plants from pests. However, these can be harmful to the environment. For example, permethrin is highly toxic to aquatic life and can also harm beneficial insects. Natural repellents are a safer alternative, but they may not be as effective. It is important to choose a repellent that is safe for the environment and your family.

Labels on insect repellents often list the active ingredients. It is important to read these labels carefully. Some repellents may contain multiple active ingredients. It is also important to check for any warnings or precautions. For example, some repellents may be unsafe for use on children or pregnant women.

Some repellents are more effective than others. For example, DEET is generally considered to be the most effective repellent against mosquitoes. However, it is also the most controversial. Permethrin is also highly effective, but it is more toxic to the environment. Picaridin and IR3535 are also effective, but they are less well-studied. Natural repellents are generally considered to be the safest, but they are often the least effective.

1 It

Application of Asan to the ground. The application of Asan to the ground is a common method of pest control. It is used to kill insects and other pests that are in the soil. Asan is a natural substance that is derived from the bark of the neem tree. It is highly effective against a wide range of pests, including mosquitoes, ticks and fleas. It is also safe for humans and other animals.

Oil of lemon eucalyptus is another natural repellent. It is derived from the leaves of the lemon eucalyptus tree. It is effective against mosquitoes and ticks. It is also safe for humans and other animals. It is often used in candles and sprays.

Garlic is also a natural repellent. It is derived from the garlic plant. It is effective against mosquitoes and ticks. It is also safe for humans and other animals. It is often used in sprays and candles.

Figure 1),

label

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## Interview

# Interview with Environment Agency Former Chief Executive, Sir James Bevan

Niall Marsay (Cranfield University, [n.h.marsay@cranfield.ac.uk](mailto:n.h.marsay@cranfield.ac.uk))

From November 2015 to March 2023, **Sir James Bevan** served as Chief Executive of the Environment Agency (EA). His extensive career encompasses roles such as UK High Commissioner to India, Chief Operating Officer at the UK Foreign Office, and Visiting Fellow at the Center for International Affairs at Harvard. Within the Foreign and Commonwealth Office, he has held senior positions in Washington, Paris, and Brussels. Sir James holds a BA (Hons) in Social Anthropology from the University of Sussex. He received the Companion of the Order of St Michael and St George (CMG) in 2006 and was knighted in 2012. Additionally, he was granted an Honorary Doctorate by Sussex University in the same year.

Do you feel like the quality of the environment has changed in your lifetime?

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In some of the recent talks. You stated yourself as an evidence-based optimist. Given that there's so much negative news on sewage pollution, emerging contaminants, and climate inac

It's really good to hear that you had passion while you were there.

It's a pleasure

to hear that

you're still

interested in

the group.



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And what about the heavy industries we rely on  
abroad?

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**Bence Solymosi (University of Leeds, cmbs@leeds.ac.uk)**

There are increasing concerns about the adverse health effects, including endocrine disruption, of persistent organic micropollutants. At present, industrial water treatment plants lack the technologies to remove these particular contaminants. The most common experimental approaches use oxidation by ozone or activated hydrogen peroxide, but these suffer from significant drawbacks, including high costs and the introduction of secondary pollution. A promising alternative is to use catalytic systems that require no activation, and thus maximise efficiency.

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**Pollutants of emerging concern**

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Upcoming meetings

## Circular Chemistry: Carbon Capture and Storage

**Where:** The Royal Society of Chemistry, Burlington House, London, W1J 0BA

**When:** 9<sup>th</sup> September 2024, 9:30-17:30

### Synopsis

The Royal Society of Chemistry

Environmental Chemistry Group

Event

(Circular Chemistry)

Carbon Capture and Storage

(Circular Chemistry)

(Environmental Chemistry Group)

Event

(Circular Chemistry)

Event

### Registration

RSC members: £50

RSC non-members: £70

1. Abstract submission

2. Registration fee

3. Lunch

## The Place of Chemistry in a Doughnut Economy

**Where:** The Royal Society of Chemistry, Burlington House, London, W1J 0BA

**When:** 14<sup>th</sup> October 2024, 11:00-16:30

### Synopsis

How can chemistry contribute to a sustainable future?

The Royal Society of Chemistry

Environmental Chemistry Group

Event

(Circular Chemistry)

(Environmental Chemistry Group)

Event

### Registration

Register here: [https://www.rsc.org/conferences/2024/10/14/1100-1630](#)

RSC members: £50

Non-members: £70

Student rate (members): £35

Student rate (non-members): £55

Online attendance: 30% off above rates.

## Air Quality in the 21st century

**Where:** The Royal Society of Chemistry, Burlington House, London, W1J 0BA

**When:** 9<sup>th</sup> December 2024, 10:00-17:00

### Synopsis

The Royal Society of Chemistry

Environmental Chemistry Group

Event

(Circular Chemistry)

(Environmental Chemistry Group)

(Air Quality)

(Air Quality)

Event

### Abstract Submission

A call for abstracts will be announced in September 2024, where we will invite delegates to present their latest research as either a platform presentation or as a poster.

### Registration

Registration details tba.