

Professor Karen Ingham

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Evidence Portfolio: *Pollinator Frocks*

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Output Description: Artefact

Author: Ingham, Karen

Year of Publication / Production: 2011

Location / Venue(s): Artist's studio when not on show

Media: Six wearable technology garments; eight bio-mimicry digital designs; public performances; videos; conference presentations; international exhibition and dissemination

URL: Three linked videos: <http://www.youtube.com/user/drkareningham/videos>



Pollinator Frocks – Eveningwear for Moths and Daywear for Butterflies

Research Context

Interdisciplinary digital design and wearable technology project involving collaboration with printing engineers, microscopists, entomologists, botanists, and surface pattern technologists, resulting in items of wearable technology clothing designed to attract and feed endangered pollinating insects. The project involved public engagement events and used performance and video as a means of publicly testing and disseminating the technological processes under-pinning the engineered fabrics. Performed and exhibited in New Zealand and the UK in 2011 with subsequent events and symposia including a conference paper at the Brandenburg Academy in Berlin. There was global media interest in the project, which can be evidenced.

Populations of insect pollinators such as bees, butterflies and moths and the plants on which they depend, are declining at alarming rates due to deleterious human activity. Through interdisciplinary collaboration with entomologists, botanists, microscopists, surface pattern technologists and print and coating engineers, Ingham created a prototype range of clothing that, through public engagement with art and science, raised greater awareness of these important issues. The *Pollinator Frocks Project* (2011) was a limited edition collection of surface pattern designs and clothing based on scanning electron microscopy images of plant pollen grains linked to endangered pollinators. These digitally enhanced images formed the basis for a range of striking and unusual printed fabrics, which acted as 'wearable gardens'. The fabrics were treated with pollinator food sources that replicated nectar, which was specially coated onto the fabric prior to cut and assemble as 'pollinator frocks'.

The project was tested through a series of performative events in the UK and in New Zealand (as part of the digital arts festival, residency, exhibition and symposium between the Govett-Brewster Art Gallery and SCANZ Eco-Sapiens). Many of the performed events were seen online and in the press and subsequently there was global media interest in the project and other performances, media events and symposia followed in the UK and in Berlin.

Research Imperatives

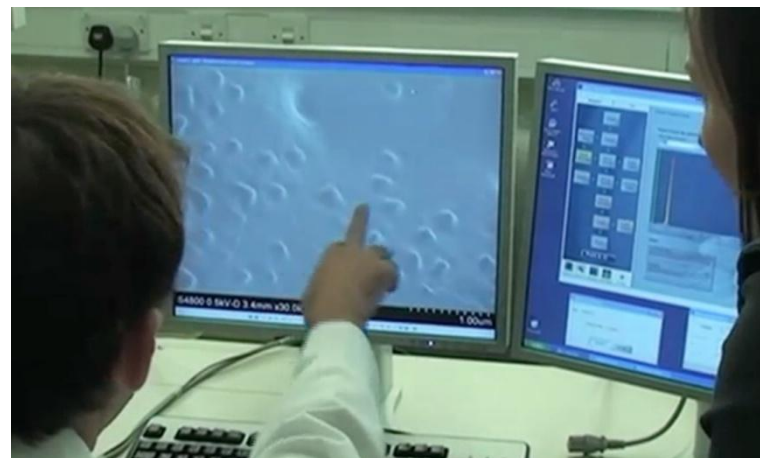
The under-pinning research question was: can contemporary design and 'eco-fashion' be used as a means of raising public awareness of the plight of the world's insect pollinators within an increasingly urban environment (with a particular focus on the 20-40 age group). In terms of art and technology interactions, the research question was if printing engineers (Swansea University) could develop and apply a subtle coating for the garments that replicated nectar, which might possibly give a food boost to alighting insects. Olfactory coatings were also applied. This was tested over a twelve months period. Another research imperative was to ascertain whether digital design using actual pollen grains and plant and insect specimens could 'mimic' the way insects view and select flowers and thus attract the insects even without the coatings. This proved to be a promising area of research and suggests that if the project were extended to other surface pattern designs in the urban environment, it may be possible to create designed pollinator corridors that work alongside actual pollinating plant corridors.

Project Methods

Each *Pollinator Frock* design is a mini natural history lesson about a particular plant-pollinator relationship. For example, the Marsh Fritillary is endangered as its larval food source, Devil's Bit Scabious, a once common meadow flower, has been virtually eradicated through intensive farming practices. The project uses research into the colours insects respond to and the way insects view flowers, taking into account theories of iridescence, ultra violet coatings, pattern theory and bio-mimicry. The vital role insects play in pollinating is emphasised by visually enhancing the pollen grains associated with the various host plants. This was achieved by collaborating with Dr. Thierry Maffeis at Swansea University using an electron-scanning microscope with a cryogenic chamber. Collaboration with printing and coating engineers at the Welsh Centre for Printing and Coating enabled experimentation with bio-mimicry by testing olfactory and UV coatings that mimic the way insects smell and view flowers, and with nectar type coatings (fructose, sucrose, and xanthum gum) designed to offer pollinators attracted to the clothes a 'food boost'. In this sense the clothing acts as a kind of 'wearable garden'. The garments were publicly tested through video performance and networked interventions (live video feeds) in New Zealand as part of a series of well publicised day and evening events. For example, The Pukekura Park *Festival of Lights* included the project as an evening performance for testing the Moth Frock on nocturnal pollinators. The project was also exhibited and performed at the Royal Society in London as part of the 'Get Britain Buzzing' campaign.



Ingham working with print engineers at the Welsh Centre for Printing and Coating at Swansea University



Collaborating with Dr. Maffei, The Centre for Nanotechnology, Swansea University

Funding

SATnet (SMU), The Welsh Assembly Government, Wales Arts International and the New Zealand Arts Council

Outcomes and Dissemination

Pollinator Frocks was publicly tested over a three week period through a series of public engagement events and performative video 'walkabouts' in New Zealand's Pukekura Parklands as part of the art, technology and ecology event SCANZ 2011, which included exhibitions, workshops and talks, and a symposium and screening of the *Pollinator Frocks* film at the Govett-Brewster Art Gallery, New Plymouth NZ, in January 2011.

It was then tested and performed in a series of public events in the UK over the summer of 2011 and formed part of a peer-reviewed conference presentation at the Brandenburg Academy of Arts and Sciences in Berlin as part of the *Art in Society Conference 2011*.

Other events included a 'catwalk' performance at The National Museum and Gallery of Wales Cardiff and video screenings and a performative walkabout at The Royal Society as part of the Buglife 'Get Britain Buzzing' campaign.

There was global media interest, which includes the following:

- Five minutes television feature item (CNTV News) included on Beijing News (Chinese and English versions)
- Radio interviews and features with BBC radio and Radio Five Live



Testing engineered nectar coating on *Daywear for Butterflies*

Magazine, online and newspaper reviews include:

Vogue

Wired

The Irish Independent

Sydney Morning Herald

Waitrose magazine

Networked Performance

Ecouterre: 'Best 6 Eco-Fashion Garments Inspired by Nature and Biomimicry 2011'

Inhabitat

The Creators Project

Global Cool 'Best of London Fashion Week

'Rouge' magazine Bulgaria

World Pollinator News

Atlantic Farmer

Inventors Spot

Times of Malta

China People's Daily

Chinese Industrial Design Magazine

CULTURE

Nectar-covered clothes provide a feast for bees

By Olivia Solon | 24 January 11



Comments 1
Artist and insect-lover [Karen Ingham](#) has created a range of clothing covered with a nectar-like food source that attracts and nourishes bees.

Populations of bees and other pollinators such as butterflies and moths and the plants on which they depend are in decline due to human activity. For example, feral [honey bee populations](#) in the US have dropped by around 90 percent in the past 50 years, while managed honey bee colonies have dropped by two thirds. A [UK-based study](#) revealed that England's bees are declining quicker than anywhere else in Europe, with more than half of hives dying out over the last two decades.

Related features

[Dropping bee pollination levels linked to climate change](#)

[Discovered: Unique bee](#)

This is a problem because more than 80 percent of crop species [depend on insect pollination](#) to some extent.

The reasons for the decline in pollinator populations include the use of agrochemicals, changing land-use, parasites/diseases and climate change.

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Fashion creates buzz with bees and butterflies

CNTV, May 18, 2011 [0 Comments](#) [Print](#) [E-mail](#)

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A Welsh artist has designed a range of eco-clothing that is not only creating a buzz in the fashion world, but is also very attractive to bees and butterflies.

Pollinating insects are in decline across the globe. The destruction of their natural habitats combined with the effects of climate change has led to their numbers dwindling at an alarming rate.



Monarch Butterfly on Pollinator Frock, networked performance, SCANZ-Eco Sapiens, New Zealand 2011



Scabious and Poppy Shirt and Morning Glory Skirt

Examples of the eight digital designs incorporating the electron scanned microscopy images of pollen grains

