A hybrid exhibition within the fields of art and chemistry

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Valency is defined as the capacity of elements to combine to form molecules and compounds. Without this ability the World would literally be a dust of single atoms. Each element has its own intrinsic ability to combine. This ability leads to the rich tapestry of the chemical world in which we live. The number of combinations approaches infinity and each has its own unique properties and signature. Throughout history there has been much exploration of this landscape and there remain untold avenues of complexity to discover.

Within Culture the property of valency has not gone unnoticed either. The bringing together of disparate objects in the concatenations of the Surrealist movement implies the construction of narratives. Apart from exploring metaphorical landscapes in the realm of consciousness, there is also the introduction of the 'axiomatic' in the field of objective philosophy. Then again, there is a simple expression in the 'curiosity in experimentation' and the 'what if' of creating new materials. These enquiries can be used to engage with, and interpret, our experience of the physical world, its energy fields and dynamics.

It is within the above context that this exhibition develops its metaphor. By bringing together diverse participants, a chemical reaction is encouraged within the imagination of the audience. Each researcher has evolved an understanding derived from their own experiences and observations of the chemical world. Visitors to the exhibition are invited to draw their own parallels and resonances and to integrate their own 'analogue' as they move within its space.

Research chemistry and contemporary art practice are often perceived as distant relatives occupying unique fields. Many of the experiments in chemistry are derived from observations of natural phenomena and then seen to be explored within the closed environment of the laboratory. Artists follow a similar path in the studio; although each has its own set of protocols. From an historical perspective both chemistry and art have been associated with magic, alchemy and the manufacture of unique compounds.

www.cipango.co.uk/valency

Valency was an exhibition which took place between the 23rd November to the 3rd of December 2023 at the APT Gallery, Deptford, London.

Curated by Paul Malone and Nicola Rae. Curating assistance by Haoyue Chen.

Supported by: Wenquin Wang
Peter and Carol Wilkinson

Participants

Adam Blaney	responsive materials
Cristina Giordano	colloids and nanomaterials
David Bloor	sound art
Huan Wang	textiles
Jan Jarosz	photography
John O'Mara	transitions
Licia Dossi	chemistry of colours
Liv Tsim	e-waste recycling
Marinus van der Sluijs	chemical mythology
Nicola Rae	interdisciplinary art
Olga F. Koroleva	video
Paul Malone	multimedia art
Sabrina Simoncelli	nano-bio photonics
WHABBstudios	environmental art

Layout of the exhibition

Valency: APT Gallery Plan

#01 Adam Blaney

#11 Olga F. Koroleva

#08 Liv Tsim

Pillar

#09 Marinus Van der Sluijs

#13 Sabrina Simoncelli

#10 Nicola Rae

#14 WHABB

Above: **Rear Gallery** ***(blacked out)***

Below: **Front Gallery** ***(with lights)***

Below: **Link Gallery**

#12 Paul Malone

#06 John O'Mara

#04 Huan Wang

#05 Jan Jarosz

#03 David Bloor

#07 Licia Dossi

#02 Cristina Giordano

#01 to #14 Information Panels

DOOR

WINDOW

Valency at the APT Gallery

The APT Gallery, Creekside, Deptford, London

About the researcher

I am a researcher and a designer with a background in architecture. I joined Imagination Lancaster in January 2020. My research interest mainly focuses on rethinking and developing digital design and fabrication processes, through prototyping, that creates responsive, adaptive and self-healing objects, products and architectural structures. My ongoing work combines design, computation, hardware and chemistry to create radically new material abilities that explores the potentials of re-programmable matter.

Additionally, I am interested in documenting practice-based research in new and fun ways to enable a wider array of outputs. My work has been presented and published in a range of international conferences and journals.

This project explores the use of ferrofluid – a liquid material that responds to magnetic fields – as a basis for future state-changing materials and objects. The project aims to fundamentally re-think how materials might be interacted with, both during the fabrication and assembly process, but also with end-users when applied to products. We hope to demonstrate that materials can be grown or 'guided' using the concept of 'tuneable environments' and imbued with adaptive capacities that are universally present with biological structures such as the ability to heal, adapt in real-time to stimulus, and even evolve as part of augmented ecologies and physical environments.

imagination.lancaster.ac.uk/person/adam-blaney

'HD-re-programmable matter project'. Exhibition movie - looking up

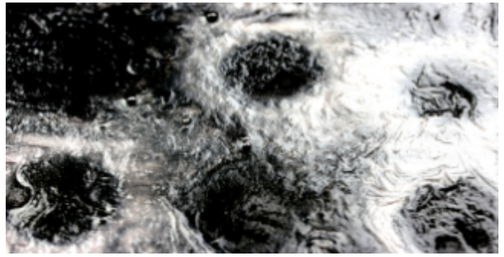
About the exhibit

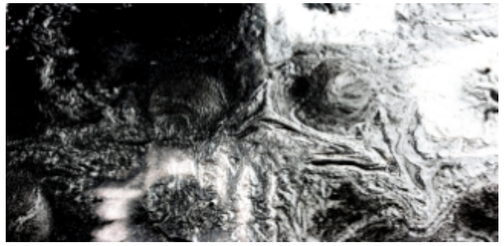
The Developing HD-re-programmable matter project is a 6-month feasibility study project funded by Connected Everything ii, starting in October. The aim of the project is to prototype physical adaptive material samples that highlight the potential trajectory for the future of sportswear. The project opens up an exciting collaboration between Design and Chemistry at Lancaster and the project's industry consultant.

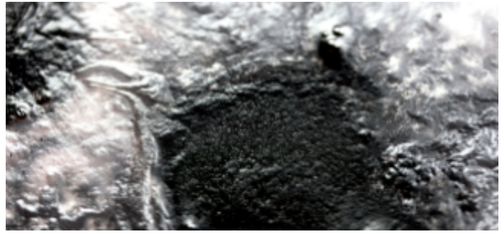
Currently, significant waste (financial, material, land) and pollution are generated from industrialised manufacturing and artificial materials because form is imposed upon materials/matter. As a result, our artificial objects, products, clothes and buildings can not physically adapt to fluctuating design demands, or, self-heal when damaged. Imagine instead, if we could physically adapt and update the materials that make up our material world. This project will develop how matter can be reprogrammed to create physically adaptive materials for the future of sportswear. The 6-month project will be developed through iterative prototyping, in collaboration with Lancaster's material science institute, as a means to investigate the implications and opportunities of what it would mean if matter that can be reprogrammed at high resolutions.

Led by Dr. Adam Blaney with his colleagues Dilan Ozkan and Dr. Mariana Fonseca Braga, this workshop will ask; What if materials could change and adapt to different conditions in response to the material crisis in the 21st century? For instance, what if athletes' clothes could change according to their needs in different circumstances (temperature, altitude etc.)? What if prosthetics could change to better adapt, providing bespoke comfort and performance? If we think on a larger scale, what if cities could grow and self-assemble like organisms? What if we could harness the use of bio-materials? What if building materials can self-heal?

How do we deal with the unpredictable behaviour of living materials? These are some of the futures encompassed by adaptive materials and the role of design[ers]. We are engaging academics working on developing new design methods for fields such as emerging technologies, bio-technologies, digital fabrication, HCI and data physicalisation. We are also involving people from the sports industry and health professionals to look through promising ways of evolving this field.







'HD-re-programmable matter project '.
Results and from the workshop

About the researcher

Cristina Giordano obtained her PhD in Physical Chemistry at the University of Palermo in 2006. After her PhD she won twice the 'assegno di ricerca' in the same University (Department of Inorganic Chemistry and Department of Physical Chemistry) as teaching assistant and post-graduated researcher. Between 2008 and 2014 she led the group of Inorganic Nanostructures at the Max Planck Institute of Colloids and Interfaces in Potsdam (Germany) where she also did her Habilitation.

At the end of 2014 she joined the Technical University of Berlin as independent researcher, to intensify her teaching, also receiving the title of 'Privatdozent' (July 2015) from the TU-Berlin. Since September 2015 Dr Giordano is Reader in Chemistry at Queen Mary University of London.

Dr Giordano is the author of almost 60 publications in the field of colloids and nanomaterial chemistry, ranging from synthesis of advanced materials to characterisationS and wide ranging applications. For her research, 2011, Dr Giordano was awarded with the 'Zsigmondy Stipendium' from the German Colloid Society, as best promising young researcher in the field of Colloids.

www.giordanogroup.org