



Security, Privacy, Identity, Trust,
Engagement, NetworkPlus

A banner for the SPRITE+ Conference. The background is a dark, orange-tinted image of hands typing on a keyboard. Overlaid on this are several white hexagonal icons connected by dashed lines, representing a network or data flow. The icons include a padlock, an eye, a fingerprint, a shield with a checkmark, and a group of people. The text 'SPRITE+ Conference' is in large white font at the top left. Below it, 'Titanic Centre, Belfast' and '28-29 June, 2023' are listed. A horizontal line separates this from the text 'Join us as we celebrate the last four years of SPRITE+, and look forward to the next!'. In the bottom right corner, the 'sprite+' logo is repeated in white, with the tagline 'Security, Privacy, Identity, Trust, Engagement, NetworkPlus' underneath it.

SPRITE+ Conference
Titanic Centre, Belfast
28-29 June, 2023

Join us as we celebrate the last four years of SPRITE+,
and look forward to the next!

sprite+
Security, Privacy, Identity, Trust,
Engagement, NetworkPlus

Full Programme



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Further information:

Logistics information including how to get to the venue can be found on our website:

<https://spritehub.org/2022/11/29/sprite-conference-logistics/>

Contact:

If you need to get in touch with us in advance of or during the conference, please email

admin@spritehub.org.

During the conference there will also be SPRITE+ staff and volunteers present to answer queries – you’ll be able to find us at the registration desk.

Welcome

Welcome to Belfast and the SPRITE+ conference! We're really delighted to have you here with us for the next couple of days as we showcase some of the work that SPRITE+ has been involved in.

SPRITE+ is a broad network encompassing a wide range of different topics from across the trust, identity, privacy and security spectrum. Our members and expert fellows come from across academia, industry, government, and civil society organisations. Since we launched in 2019, we've focused on events and activities that bring together our diverse membership to help build collaborations and share knowledge across disciplinary and sector boundaries. We're showcasing some of the results this week, and you will get a sense of the network's diversity from our agenda.

We have three terrific keynote speakers and as well as short talks and panel discussions, you'll also get the chance to participate in workshops. The posters and demonstrations showcase emerging research and innovative approaches to digital trust and security. We know that whichever sessions you choose to attend, you'll find them thought-provoking and informative.

There's plenty of time for networking and we know you'll be looking forward to catching up with friends and colleagues and making new connections. If you need it, there's quiet space available on the Bridge (5th Floor) for meetings or simply to take a break from the main conference areas. And of course, we have time to relax together on the evening of day 1 with a tour of the Titanic galleries, a reception and full-service dinner.

Finally, we're grateful to UKRI for our first four years of funding and delighted that we have been awarded a grant for a further four years to continue to develop the network. This is your network, and we want to make sure it serves your needs. So we are keen to hear from you about what SPRITE+ activities you've found valuable and what we can improve on – please share your thoughts with members of the Management Team over the course of the next two days.

Thank you for joining us this week. We hope that you leave this conference feeling inspired, with new knowledge, new potential research directions, and new connections!

Director: Emma Barrett

Co-Directors: Vladimiro Sassone, Sakir Sezer, Mark Elliot, Stacey Conchie, Hamed Haddadi

Conference sub-committee: Vladimiro Sassone, Emma Barrett, Mark Elliot, Catherine Rhodes, Ayushi Gupta

Programme Overview

DAY 1 – 28 JUNE		
09:15 - 09:45	Welcome – Emma Barrett	Titanic Suite
09:45 - 10:15	Keynote – Professor Maire O’Neill	Titanic Suite
10:15 - 10:45	Coffee Break Demonstrations	Olympic Suite Britannic Suite
10:45 - 11:35	Short Talks: Communicating Cybersecurity SPRITE+ Challenge Working Groups	Titanic Suite Britannic Suite
11:40 - 12:30	Short Talks: Digital Trust and Consumers	Titanic Suite
11:40 - 13:00	Workshop: Using Design Fiction to Identify Future Vulnerabilities in Bio-IoT	Britannic Suite
12:30 - 13:00	Poster Session	Olympic Suite
13:00 - 14:00	Lunch & Posters Demonstrations	Olympic Suite Britannic Suite
14:00 - 15:00	Short Talks: Future Technologies Workshop: What Can Social Identity do for TIPS	Titanic Suite Britannic Suite
15:10 - 16:00	Lightning Talks Panel: Cyber Refugees	Titanic Suite Britannic Suite
16:00 - 16:30	Coffee Break Demonstrations	Olympic Suite Britannic Suite
16:30 - 17:00	UKRI Update	Titanic Suite
17:00	Access to the Titanic Galleries	
18:30	Drinks Reception	Olympic Suite
19:00	Dinner	Titanic Suite

DAY 2 – 29 JUNE 2023		
09:00 - 09:30	SPRITE+ Phase 2 Call to Action – Mark Elliot	Titanic Suite
09:30 - 10:00	Keynote – Hugo Vincent	Titanic Suite
10:10 - 11:00	Short Talks: Threat and Mitigation	Titanic Suite
10:10 - 10:35	Short Talks: Dignity and Safety ‘By Design’	Britannic Suite
10:35 - 11:00	Short Talks: TIPS in a Post-Covid World	Britannic Suite
11:00 - 11:30	Coffee Break Demonstrations	Olympic Suite Britannic Suite
11:30 - 12:30	Keynote – Professor Ciaran Martin	Titanic Suite
12:30 - 13:30	Lunch & Posters Demonstrations	Olympic Suite Britannic Suite
13:30 - 15:00	Workshop: Dictionary of Privacy	Britannic Suite
13:30 - 14:20	Short Talks: Digital Identity Sandpit Projects	Titanic Suite
14:25 - 15:15	Lightning Talks	Titanic Suite
15:15 - 15:30	Closing Remarks – Mark Elliot and Emma Barrett	Titanic Suite



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Programme Details

Wednesday 28 June

08:30 – 09:15

Entrance Foyer

Arrival and registration

Olympic Suite

Coffee and breakfast pastries

Posters will be on display from around 08:45 and throughout the conference

09:15 – 09:45

Titanic Suite

Welcome – Emma Barrett, Director SPRITE+

09:45 – 10:15

Titanic Suite

Keynote – Professor Máire O’Neill

‘Machine Learning and Hardware Security’

Director of ECIT, Queen’s University Belfast

Chair: Emma Barrett, Director SPRITE+

10:15 – 10:45

Olympic Suite – coffee break

Britannic Suite – **Demonstrations**

(for details see page 20)

10:45 – 11:35

Parallel Sessions

Titanic Suite

Short Talks: Communicating Cyber Security

Chair: Vladimiro Sassone, SPRITE+ Co-I

The Cybersecurity of Fairy Tales – Luca Vigano

Risk Awareness and Psychological Nudging in Tech – Marie Oldfield

Measuring Impact of Awareness Campaigns through Cybersecurity Awareness Month –

Nadine Michaelides

Britannic Suite

SPRITE+ Challenge Working Groups

Chair: Stacey Conchie, SPRITE+ Co-I

Digital Technologies, Power & Control – Lara Frumkin

Accountability & Ethics in a Digital Ecosystem – Jonathan Foster

11:35 – 11:40

Five-minute break

11:40 - 13:00

Parallel Sessions

Titanic Suite

11:40 – 12:30

Short Talks: Digital Trust and Consumers

Chair: Hamed Haddadi, SPRITE+ Co-I

Coordinated Cryptocurrency-Related Social Media Campaigns – Tasos Spiliotopoulos

Footprints to Emissions – David Ellis

Young Learners' Mental Models of Online Sludge – Karen Renaud

Buy Now Pay Later – Lucia Cervi



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Britannic Suite

11:40 – 13:00

Workshop: FiVu: Using Design Fiction to Identify Future Vulnerabilities in Bio-IoT

Led by Charles Weir

Here's a bit of fun. Could science fiction help a team of software developers to threat model the security and privacy for their products? Try it for yourself in this workshop.

We in the FiVu project have taken a futuristic case study project and asked sci-fi enthusiasts to suggest relevant stories about possible security and privacy issues. We've done some creative writing and created short versions of three stories to act as prompts for a threat modelling session. Can you take the roles of the software developers, and come up with the new, and exciting, threats for the product?

Olympic Suite

12:30 – 13:00

Poster Session

(For details of posters see page 21)

Olympic Suite

13:00 – 14:00

Lunch

Britannic Suite

Demonstrations

(for details see page 20)

14:00 – 15:00

Parallel Sessions

Titanic Suite

Short Talks – Digital Trust and Consumers

Chair: Sakir Sezer, SPRITE+ Co-I

ICO Tech Futures: Data Protection implications of Immersive Technologies – Clare Hillis,
Information Commissioner’s Office

Vulnerabilities and the Potential for Harm in Immersive Police Training Using Extended Reality –
Lena Podoletz

This is Not My Jetpack: The Real Lessons from Science Fiction – Jared Shurin

Trust, Rights, and Identity in the Metaverse – Sarah Clinch, Jill Marshall, and Sophie Nightingale

Britannic Suite

Workshop - What Can Social Identity do for TIPS?

Led by Mark Levine

How can we use social psychology to better understand and predict human behaviour in complex systems? In this workshop we explore the practical utility of the Social Identity approach (SIA) for enhancing trust, privacy and security in digital contexts.

15:00 – 15:10

Ten-minute break

15:10 – 16:00

Parallel Sessions

Titanic Suite

Lightning Talks

Chair: Luca Vigano, SPRITE+ Expert Fellow

Virtual Adventures Made Safe: Diving into Parent, Adult and Child Perspectives for Next Level Social VR Protection and Moderation! – Cristina Fiani

Stalking and Cyberstalking in Australia: An Examination of Comparative Harms Across Crime Types – Nakshathra Suresh

Digital Risk Awareness: Lessons from Disaster Risk – Carl Adams

Identity’s Future in the Digital Economy: How Technology Transforms Our Meaning of Identity Within Digital Economies – Ste Bergin

Cyber Diplomacy: Diplomatic Action in International Relations on Cyberspace – Amel Attatfa

Why Can’t the United States Gain Privacy Adequacy with the EU? – Jordan Shapiro

Britannic Suite

Panel – Cyber Refugees: The Refugee Convention and Cyber Threats

Led by Richa Kumar and Robin Renwick – Trilateral Research

It is reported that at the end of 2021, the total number of people worldwide forced to flee their homes due to conflicts, violence, fear of persecution and human rights violations was 89.3 million. In this evolving security landscape, cyberattacks can be the next generation trigger for people to seek asylum status. This new form of threat requires us to reinterrogate the cornerstones of the Refugee Convention, to understand potential implications for our evolving understanding of refugees and asylum seekers.

This workshop explores ways in which cyber threats might result in situations of people fleeing, seeking refugee status. It will ask of panellists - can we conceptualise a notion of ‘cyber-refugees’ to understand those seeking asylum owing to cyber threats?

16:00 – 16:30

Olympic Suite – coffee break

Britannic Suite – **Demonstrations**

(for details see page 20)



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16:30 – 17:00

Titanic Suite

UKRI Update

Mark Gaskarth, Head of Theme, Digital Security and Resilience, EPSRC

Chair: Emma Barrett

17:00

Access to the Titanic Galleries

18:30

Olympic Suite

Drinks Reception

19:00

Titanic Suite

Dinner

21:00

Close of Day 1



Security, Privacy, Identity, Trust,
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Thursday 29 June

08:30 – 09:00

Arrival

Olympic Suite

Coffee and breakfast pastries

09:00 – 09:30

Titanic Suite

SPRITE+ Phase 2 Call to Action

Mark Elliot, incoming Director, SPRITE+

09:30 – 10:00

Titanic Suite

Keynote – Hugo Vincent

Head, Security Group at Arm Research

Chair: Mark Elliot, incoming Director, SPRITE+

10:00 – 10:10

10-minute break

10:10 – 11:00

Parallel Sessions

Titanic Suite

Short Talks – Threat and Mitigation

Chair: Ciara Rafferty, SPRITE+ Expert Fellow



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Trust Mapping: Workshopping Social Distributions of Knowledge in Security Practice –

Matt Spencer

Security and Privacy in the Age of Ubiquitous Computing – Mohamed Khamis

New Research Collaboration on Hardware Security – Ahmad Atamli

Stupid "Smart": The Limitations of Digital Systems and the Outcomes of Deception –

Andrew Peck

Britannic Suite

10:10 – 10:35

Short Talks – Dignity and Safety ‘By Design’

Chair: Hamed Haddadi, SPRITE+ Co-I

God, The Oracle and the Nightclub Bouncer – Ozlem Ulgen

Encoding the Enforcement of Safety Standards into Smart Robots to Harness their

Computing Sophistication and Collaborative Potential: A Legal Risk Assessment for EU

Policymakers – Riccardo Vecellio Segate and Angela Daly

10:35 – 11:00

Short Talks – TIPS in a Post-Covid World

Chair: Emma Barrett, SPRITE+ Director

Shadow Infrastructures – Martin Gallagher, Jessamy Perriam, and Ashley Brooks

Privacy, Control, and the Future of Money – Geoff Goodell

11:00 – 11:30

Olympic Suite – coffee break

Britannic Suite – **Demonstrations**

(for details see page 20)



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11:30 – 12:30

Titanic Suite

Keynote – Professor Ciaran Martin

Professor of Practice in the Management of Public Organisations at the Blavatnik School of Government, University of Oxford and former Head of the UK National Cyber Security Centre

Chair: Vladimiro Sassone

12:30 – 13:30

Olympic Suite

Lunch

Britannic Suite

Demonstrations

(for details see page 20)

13:30 -15:00

Parallel Sessions

Titanic Suite

13:30 – 14:20

Short Talks – Digital Identity Sandpit Projects

Chair: Stacey Conchie, SPRITE+ Co-I

Digital Identity and Life-Course Study – Yang Lu and Yongyu Zeng

Smoothing the Digital Identity Onboarding Process – Tasos Spiliotopoulos

Building a Minimal Viable Digital Identity from Digital Footprints/Traces – Andrew M'manga and Anita Khadka

Digital Product Passports: Unintended Consequences for Human Digital Identity – Bianca Slocombe and Richard Jones

14:25 – 15:15

Lightning Talks

Chair: Emma Barrett, SPRITE+ Director

The Role of Trust in Digital Banking – Daniel Broby

How can we incentivise cybersecurity data sharing between organisations? An Overview of the Experimental and Behavioural Economics Literature – Lily Thompson

Ethical Dilemmas when Using Digital Data – Heather Shaw

Accelerating Homomorphic Encryption for Privacy Preserving Data Analysis – Ciara Rafferty

Quantum Secure Cryptography: Preparing for the Storm – Ayesha Khalid

Creating Privacy Aware Digital Identity in the Metaverse Ecosystem – Saurav Sthapit

Britannic Suite

13:30 – 15:00

Workshop: Dictionary of Privacy

Led by Mark Elliot, Anna-Maria Mandalari and Miranda Mourby

Four SPRITE+ fellows are creating a Dictionary of privacy. This will be published by Elgar as an open access book and will therefore also be accessible on the SPRITE+ hub. The ambition is that this will become a community resource and the go to reference for the definitions of terms.

This workshop is an opportunity to feed into the construction of the dictionary and also of potential companion resources. For example, we are also assembling a companion document which is a directory of key artefacts.



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15:15 – 15:30

Titanic Suite

Closing Remarks

Emma Barrett and Mark Elliot

Close Day 2

If you wish to continue any informal discussions, you can stay in the venue until 16:00.

Keynote Speakers

Professor Máire O’Neill



Abstract: Machine Learning and Hardware Security

With the globalisation of supply chains the design and manufacture of today’s electronic devices are now distributed worldwide, for example, through the use of overseas foundries, third party intellectual property (IP) and third party test facilities. Many different untrusted entities may be involved in the design and assembly phases and therefore, it is becoming increasingly difficult to ensure the integrity and authenticity of devices. The supply chain is now considered to be susceptible to a range of hardware-based threats, including hardware Trojans, IP piracy, reverse engineering, IC cloning and side-channel attacks. These attacks are major security threats to military, medical, government, transportation, and other critical and embedded systems applications. This talk will explore the role machine learning has to play in hardware-based threats and in improving hardware security.

Short Bio

Professor Máire O’Neill, FEng, FIAE, MRIA, is Regius Professor in Electronics and Computer Engineering and Director of the Centre for Secure Information Technologies (CSIT) at Queens University Belfast, N.Ireland. She is also Director of the £5M UK-wide Research Institute in Secure Hardware and Embedded Systems (RISE: www.ukrise.org) and is a member of the UK AI Council. She is chair of the IEEE Circuits and Systems for Communications Technical Committee. She previously served as Associate Editor for IEEE TC and IEEE TETC. She has received numerous awards which include a Blavatnik Engineering and Physical Sciences medal, 2019, a Royal Academy of Engineering Silver Medal, 2014 and British Female Inventor of the Year 2007. She has authored two research books, 6 book chapters and 190 peer-reviewed conference and journal publications. She is a Fellow of the Royal Academy of Engineering, a member of the Royal Irish Academy and Fellow of the Irish Academy of Engineering.

Professor Ciaran Martin



Short Bio

Professor Ciaran Martin, CB, is a Professor of Practice at the Blavatnik School of Government at the University of Oxford, as well as a managing director at Paladin Capital and the holder of several other advisory roles in private sector cyber security. He writes and speaks frequently on cyber security in major outlets across the world, and was named one of the most influential people in European technology by Politico in 2022.

From 2014 until 2020 he set up and then led the United Kingdom's world-leading National Cyber Security Centre, within the intelligence agency GCHQ on whose board he sat.

This was the culmination of a 23-year career in UK public service which saw him serve in senior roles in national security, constitutional and economic policy.

Hugo Vincent



Short Bio

Hugo Vincent is a Principal Security Architect in the Systems & Security research group, Architecture & Technology Group, Arm, Cambridge, and previously headed the Security group in Arm Research. His research currently focuses on confidential compute, privacy enhancing technologies, reactive security, cryptographic provenance, and capability architectures. In his 12-year tenure at Arm, he has contributed to the design of security and cryptography features in Arm processors, to embedded operating systems, hypervisors, and system architecture, and has worked with a wide range of Arm's commercial and academic partners including DARPA and the University of Cambridge.

Demonstrations

Britannic Suite

Run by Joe Bourne, PETRAS National Centre of Excellence for IoT Systems
Cybersecurity, and Lancaster University

Artists' responses to the research of the Power2: Understanding disruptive powers of IoT in the energy sector

An interactive exhibition of four artists' responses to the [research of Power2](#). Engaging delegates in creative activities which explore their relationship with the cybersecurity and cyberharms of digital energy transitions.

Hack Your Age: Exhibition of provocative IoT prototypes designed by older adults

In November of 2022, a design researcher, creative technologist and theatre company worked with 15 adults defining themselves as 'experiencing or anticipating old age' to explore their changing relationship with technology and perceptions of IoT and data driven technologies. Over three workshops utilizing theatre and design research approaches including speculative design (REF), co-design (ref) and provocative prototyping (REF), participants designed a prototype and wrote and performed a play exploring its potential pitfalls. This demonstration is an exhibition of the four provocative, and problematic, prototypes designed by older, non-technical experts:

- A body scanner which can order bespoke haute couture clothing which fits an older person's changing body
- The voice assistant's voice assistant ensures you will always be able to control your voice activated devices by repeating earlier commands at the press of a button or enhancing your commands
- Exoskeletal leg braces which learn gait and sense environment to provide subtle support to ensure a flight of stairs feel like they did ten years ago.
- A future development on smart meters which detect gas leak and immediately shuts off your gas and call out an engineer.

Posters

Posters will be on display in the Olympic Suite throughout the conference. There will be a specific session when presenters will be by their posters ready to discuss them with you, from 12:30 - 13:00 on Day 1.

Some presenters are also giving related lightning talks – see main programme.

1	Using behavioural analytics in tackling digital trust challenges in current healthcare systems <i>Kate Han and Naixin Guo</i>
2	Building a dictionary of affordances of minimal digital identities from digital footprints <i>Yuchen Zhao</i>
3	User-centred privacy and security in extended reality (XR) <i>Mohamed Khamis, Mark McGill, Melvin Abraham, Cristina Fiani</i>
4	Digital biometrics: an umbrella review of reviews <i>Heather Shaw</i>
5	Verifying digital identity: how can we build a trustworthy and secure digital identity? <i>Anita Khadka</i>
6	Cyber diplomacy: diplomatic action in international relations on cyberspace <i>Amel Attatfa</i>
7	Accelerating homomorphic encryption for privacy preserving data analysis <i>Dr Ciara Rafferty</i>
8	Digital risk awareness: lessons from disaster risk <i>Carl Adams</i>
9	Virtual adventures made safe: diving into parent, adult and child perspectives for next-level social VR protection and moderation! <i>Cristina Fiani</i>
10	Identity's future in the digital economy: how technology transforms our meaning of identity within digital economies <i>Ste Bergin</i>
11	Creating privacy aware digital identity in the metaverse ecosystem <i>Saurav Sthapit</i>
12	Quantum secure cryptography: preparing for the storm <i>Dr Ayesha Khalid</i>
13	Stalking and cyberstalking in Australia: An examination of comparative harms across crime types <i>Nakshathra Suresh</i>

Poster Voting Instructions

You can access a voting form by scanning the QR code below, or at:

<https://forms.office.com/e/nrHeHsS4ef>

You will be able to select up to three posters, which you think best meet the criteria of:

- Relevance – to the future of digital trust, identity, privacy and security.
- Significance – makes an interesting / novel contribution to understanding of an aspect of TIPS in theory and / or practice.

