



Programme of Events 2023/24

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The IET Sussex Network has arranged 13 talks over the 2023/24 season, from October to May. You can register for talks by going to our web site ([www.theiet.org/sussex](http://www.theiet.org/sussex)) and following the link under 'Our events:'. From our home page you can also find links to the events programmes of our neighbouring IET Networks and other Professional Engineering Institutions that hold talks in our area.

This season, as for the last, our talks are all in-person events, being held either at the Hawth Theatre in Crawley or at the University of Sussex in Falmer. Refreshments are provided before the talks and you have a chance to chat with other members and guests.

All events advertised on these pages are also open to members of the IMechE, BCS, ICE, IMarEST, IOM, RAeS and RCEA and guests are welcome at all events. Where the speakers agrees, we will endeavour to record the talk and post the video on the Sussex Network YouTube channel. Details can be found on our home page.

For those of you who prefer to view the programme of events offline, you will find a pdf version at the bottom of this blog which you can download. Please remember that information will be added to the programme as it becomes available, so any downloaded version may be out of date.

The IET accept no responsibility for any loss, injury or inconvenience caused to members or guests in consequence of their attendance at events. Members/guests who are concerned as to the availability of disabled access to any event/visit should enquire in the first instance to the contact email on our home page. Failing this, any committee member will be willing to assist. Registration is required for all meetings, which can be done through our home page.

At the time of writing (August 2023) not all details had been finalised. So if details of a talk are missing then please come back to this page at a later date.

# Events 2023

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| <b>Crawley</b>                                                                                                                                                                                                                                                                                                                                                | <b>Tuesday 3rd October</b> | <b>18:30 for 19:00</b> |
| <b>Moonshine – jamming enemy radar in WW2</b>                                                                                                                                                                                                                                                                                                                 |                            |                        |
| Professor Simon Watts, University College London                                                                                                                                                                                                                                                                                                              |                            |                        |
| British active radar jamming started during WW2 in 1942, with the Moonshine airborne pulse repeater jammer, spoofing enemy long-range air defence radars. Moonshine was later used as part of the deceptions for the D-day landings in 1944. This talk will describe the Moonshine equipment, its operational uses and the radars it was intended to deceive. |                            |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                                                                                                                                                                          |                            |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                       |                            |                        |
| Registration required. Go to <a href="https://theiet.org/sussex">theiet.org/sussex</a> and follow links to events.                                                                                                                                                                                                                                            |                            |                        |

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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Tuesday 17th October</b> | <b>18:30 for 19:00</b> |
| <b>Can we Trust ChatGPT?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                        |
| Dr Julie Weeds, Senior Lecturer in Computer Science and Artificial Intelligence, University of Sussex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |                        |
| The media has everyone excited about pre-trained large language models (LLMs), such as OpenAI's ChatGPT and Google's Bard, which can generate human-like responses to questions and requests for information. In this talk, I will describe the evolution of language modelling over the last 20 years including n-gram models, word-vector models, deep neural networks and the transformer architecture underlying many LLMs. I will discuss strengths, weaknesses and pitfalls as well as current research at Sussex evaluating the accuracy of the information in text generated by LLMs such as ChatGPT. |                             |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                        |
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| <b>Crawley</b>                                                                                                                                                                                                | <b>Tuesday 7th November</b> | <b>18:30 for 19:00</b> |
| <b>Crop Circles</b>                                                                                                                                                                                           |                             |                        |
| Andy Thomas, Author and Lecturer                                                                                                                                                                              |                             |                        |
| With a stunning slideshow Andy Thomas explores the extraordinary and controversial phenomenon of crop circles looking at their fascinating history and discussing possible theories which might explain them. |                             |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                          |                             |                        |
| Refreshments from 18:30                                                                                                                                                                                       |                             |                        |
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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Tuesday 21st November</b> | <b>18:30 for 19:00</b> |
| <b>Engineering the Ultimate Bass Guitar</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                        |
| Richard Fairall, Senior Engineer - Electronic Systems, Elekta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                        |
| <p>Now for something after-hours!</p> <p>Even as a child in the '80s, technical creativity and music were in my bones. From analysing Space Shuttle plans to recreating the Table Mountain cable car in Lego to teaching myself to program an Apple II... and all while wearing out Duran Duran cassettes! The programming plus creative tech would eventually lead to a career as electronics engineer for Elekta R&amp;D, facilitating ground-breaking MRI-linear accelerators... while the Duran Duran plus creative tech saw this starry-eyed teen tie a piece of string to a plank of pine and amplify it with an earphone transducer...</p> <p>Some 30 years on in my personal quest to create the ultimate fretless electric bass guitar, I'm putting my chisels to my most innovative design yet.</p> <p>In this light-hearted talk, I'll delve into some of the surprising science within solid-body electric stringed instruments. I'll reveal a couple of remarkable ways by which pioneering guitar makers are taking the ol' classic Fender bass into the space age. And I'll explore several "life's engineering" instincts I've gained – both in my day job and in this unique space where engineering meets emotion!</p> <p>Get your groove on and let's take a walk in the woods!</p> |                              |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                        |
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| <b>Crawley</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Tuesday 12th December</b> | <b>18:30 for 19:00</b> |
| <b>Innovations for Airport Operational Efficiency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                        |
| Abhi Chacko, Head of Innovation and Commercial IT, Gatwick Airport                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                        |
| <p>In 2022, Gatwick Airport was the 2nd busiest airport by total passenger traffic in the UK and was the 8th busiest in Europe by total passenger traffic. The introduction of technology is important for the airport to handle large numbers of passengers efficiently. Abhi's talk will cover the implementation of recent technical innovations to improve the airport's operational efficiencies:</p> <ul style="list-style-type: none"> <li>- Using airline apps for bag drop and boarding gate interactions</li> <li>- Applying AI for cabin baggage screening</li> <li>- Autonomous PoDs for wheelchair users</li> <li>- Smart Stand enabling improving aircraft turn around operations</li> <li>- Autonomous bag transfer etc.</li> </ul> |                              |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                        |
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## Events 2024

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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Tuesday 16th January</b> | <b>18:30 for 19:00</b> |
| <b>Building quantum computers for disruptive industry applications</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |                        |
| Winfried Hensinger, Professor of Quantum Technologies, University of Sussex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |                        |
| <p>Making use of strange quantum phenomena, such as superposition and entanglement (referred to by Einstein as spooky), it is possible to build computers that can solve industry problems, that would require millions of years of computing time on even the fastest supercomputer. Such problems include drug discovery, making aircraft engines more fuel efficient, using less energy for the production of fertilizer (2% of world's energy is used for fertilizer production) but really span across nearly any industry sector. Current quantum computers can only operate with around 100 quantum bits while most disruptive industry applications would require quantum computers that can process millions of quantum bits. I will report on a recent achievement (<a href="https://www.bbc.co.uk/news/science-environment-64492456">https://www.bbc.co.uk/news/science-environment-64492456</a>) that enables the construction of quantum computers with millions of quantum bits and I will discuss the path forward to build such machines.</p> |                             |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                        |
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| <b>Crawley</b>                                                                                                                                                                                                                                                                    | <b>Tuesday 6th February</b> | <b>18:30 for 19:00</b> |
| <b>Enabling self-service grid connections</b>                                                                                                                                                                                                                                     |                             |                        |
| Ian Cooper, Head of Innovation Delivery, EA Technology                                                                                                                                                                                                                            |                             |                        |
| <p>How can we electrify more, and more quickly, to reach our net zero carbon goals? This presentation will cover the current state of the art in LV and HV self-service connections in UK, introduce the grid connections process and cover how DNOs are providing visibility</p> |                             |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                                                                                              |                             |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                           |                             |                        |
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# Sussex Network

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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Tuesday 20th February</b> | <b>18:30 for 19:00</b> |
| <b>Is Hydrogen THE energy vector for Net Zero?</b>                                                                                                                                                                                                                                                                                                                                                                        |                              |                        |
| Abigail Dombey, Energy & Sustainability Engineer, Net Zero Associates Ltd                                                                                                                                                                                                                                                                                                                                                 |                              |                        |
| Hydrogen is being hyped as THE energy vector for the transition to net zero. However, whilst it will be essential for the decarbonisation of many areas of the economy, there will be limits to its use. This presentation will identify the key uses for hydrogen / hydrogen derived fuels, those where there are likely to be more efficient alternatives to hydrogen, and will discuss Sussex's strengths in hydrogen. |                              |                        |
| Jubilee 144, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                                                                                               |                              |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                        |
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| <b>Crawley</b>                                                                                                                                                                                                                                                                                                                                                             | <b>Tuesday 5th March</b> | <b>18:30 for 19:00</b> |
| <b>2023 Southern Railway 100</b>                                                                                                                                                                                                                                                                                                                                           |                          |                        |
| Malcolm Johnson, Curator, Bluebell Railway Museum                                                                                                                                                                                                                                                                                                                          |                          |                        |
| The talk will focus on the anniversary of the creation of Southern Railway 100 years ago this year and explore why it happened and was it the right thing to happen. We will look at how it effected the Bluebell Railway and other local railway line. Particularly it will examine the vital role that electrical engineering played in the success of Southern Railway. |                          |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                                                                                                                                                                                       |                          |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                    |                          |                        |
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| <b>Falmer</b>                                                                                                                                                                                                                                                                  | <b>Tuesday 19th March</b> | <b>18:30 for 19:00</b> |
| <b>Cobotics: joint with IMechE ADSC</b>                                                                                                                                                                                                                                        |                           |                        |
| Professor Peter Childs, Imperial College, London                                                                                                                                                                                                                               |                           |                        |
| Collaborative robotics enables the leverage of two amazing resources operating in synergy – humans and robots. This presentation will explore the topic of human and robotic collaborative working, arising issues and opportunities, along with some commercial case studies. |                           |                        |
| Jubilee 144, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                    |                           |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                        |                           |                        |
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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                     | <b>Tuesday 16th April</b> | <b>18:30 for 19:00</b> |
| <b>An Astronomical Learning Curve – A Complete Beginner’s Guide to Processing of “Backyard” Planetary Images</b>                                                                                                                                                                                                                                  |                           |                        |
| Greame Awcock                                                                                                                                                                                                                                                                                                                                     |                           |                        |
| This presentation will give a guided tour of Graeme Awcock's joyous journey of discovery that even complete beginners can achieve astonishing images of the spectacular planets in our solar system from their back-garden. Even better, this can be achieved with the aid of extraordinarily competent software that is freely available to use. |                           |                        |
| Jubilee 144, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                       |                           |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                           |                           |                        |
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| <b>Crawley</b>                                                                                                    | <b>Tuesday 7th May</b> | <b>18:30 for 19:00</b> |
| <b>Home Battery Systems</b>                                                                                       |                        |                        |
| Mike Underhill                                                                                                    |                        |                        |
| Synopsis TBA                                                                                                      |                        |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                              |                        |                        |
| Refreshments from 18:30                                                                                           |                        |                        |
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| <b>Falmer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Tuesday 21st May</b> | <b>18:30 for 19:00</b> |
| <b>Unlocking Data Acquisition and Telematics: Design, Compliance, and Funding Insights</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                        |
| Subu Ghimire, Electronics Engineer (KTP Associate), University of Brighton                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                        |
| In this presentation, Subu and Joe will explore the design considerations behind a data acquisition and telematics system. They will discuss the latest developments in data acquisition systems and share insights from their Knowledge Transfer Partnership project, which focused on designing a DAQ system that adheres to compliance standards for geotechnical site investigation and testing. Additionally, they will touch upon various funding opportunities that support research collaboration between local SMEs and academia, fostering innovation in the process. |                         |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                        |
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| <b>Crawley</b>                                                                                                     | <b>Tuesday 1st October</b> | <b>18:30 for 19:00</b> |
| <b>Battery Technology</b>                                                                                          |                            |                        |
| Qiong Cai, Professor in Sustainable Energy and Materials, University of Surrey                                     |                            |                        |
| Synopsis TBA                                                                                                       |                            |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                               |                            |                        |
| Refreshments from 18:30                                                                                            |                            |                        |
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| <b>Falmer</b>                                                                                                      | <b>Tuesday 15th October</b> | <b>18:30 for 19:00</b> |
| <b>Title TBA</b>                                                                                                   |                             |                        |
| Speaker TBA                                                                                                        |                             |                        |
| Synopsis TBA                                                                                                       |                             |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                           |                             |                        |
| Refreshments from 18:30                                                                                            |                             |                        |
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| <b>Crawley</b>                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Tuesday 5th November</b> | <b>18:30 for 19:00</b> |
| <b>Why have weather forecasts improved?</b>                                                                                                                                                                                                                                                                                                                                                                                         |                             |                        |
| Bob Riddaway, Meteorological Training, Forecasting and Technology, ex-President of the European Meteorological Society                                                                                                                                                                                                                                                                                                              |                             |                        |
| Technological developments have underpinned the increase in accuracy of weather forecasts. In particular, from the mid-1960s the use of increasingly sophisticated numerical models coupled with an enhanced availability of observations have led to modern five-day forecasts being as accurate as one-day forecasts 50 years ago. These developments will be discussed along with benefits of having accurate weather forecasts. |                             |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                                                                                                                                                                                                                                                                                                                                                |                             |                        |
| Refreshments from 18:30                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                        |
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| <b>Falmer</b>                                                                                                      | <b>Tuesday 19th November</b> | <b>18:30 for 19:00</b> |
| <b>Title TBA</b>                                                                                                   |                              |                        |
| Speaker TBA                                                                                                        |                              |                        |
| Synopsis TBA                                                                                                       |                              |                        |
| Fulton A, University of Sussex, Falmer, Brighton BN1 9QT                                                           |                              |                        |
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| <b>Crawley</b>                                                                                                     | <b>Tuesday 3rd December</b> | <b>18:30 for 19:00</b> |
| <b>Title TBA</b>                                                                                                   |                             |                        |
| Speaker TBA                                                                                                        |                             |                        |
| Synopsis TBA                                                                                                       |                             |                        |
| Studio Theatre, The Hawth Theatre, Crawley, RH10 6YZ                                                               |                             |                        |
| Refreshments from 18:30                                                                                            |                             |                        |
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