KEYNOTE SPEAKER: Professor Leslie Carr will speak about 'Upheaval in Computing'. Les is Professor of Web Science in the Department of Electronics and Computer Science and a Director of the Web Science Institute and Director of the Web Science Centre for Doctoral Training at the University of Southampton. He has also been instrumental in setting up CAS South East.

SESSION ONE WORKSHOP CHOICES (10.25 – 11.25)

1a Cross Curricular Computational Thinking – Led by Ceredig Cattanach-Chell, OCR
This will look at delivery of computational thinking across other curriculum areas, as well as computer science. Suitable for KS3 – K35

1b Engaging young women in the computing classroom – Led by Emma-Ashley Liles, CAS #include and Stemettes
Practical advice about engaging young women in the computing classroom based on Google and NCWIT research. Suitable for KS3 – K35

1c Strategies for Teaching Programming – Led by Dr Sue Sentence, Senior Lecturer in Computer Science Education, Kings College London
This session will draw on research in the learning of computer programming to present some strategies to build student's confidence in (text-based) programming. The focus will be on developing an understanding of program logic and the underlying algorithm to support learning. This session is for you if you have students who may find programming challenging or frustrating. Suitable for KS3 – K35

1d Barefoot - does it have a place in Secondary? – Led by Jane Waite, CAS London
This workshop will provide a whistle stop tour of the primary Barefoot resources and then a review of how these might be useful in KS3. This session will show you what SOME of your feeder schools may have done with their pupils, so you can better understand transition challenges. Some of the resources and approaches may be useful for Year 7, or pupils with SEND. This is for NON specialist KS3 teachers who are new to computer science and don't have a clue what computational thinking is and how it might be used in computing lessons. Suitable for KS3 – K35

1e Simple Programmable Robotics Using the BBC micro:bit – Led by Kevin Spurr, Kitronix Ltd
Learn how to create and program simple robotic buggies using the BBC micro:bit. The buggies will first be coded to run on their own and you will also learn how to control them wirelessly using a second BBC micro:bit or mobile device (phone or tablet). Suitable for KS3

1f Using questions to assess computing (Project Quantum) – Led by Chris Roffey, Quantum content steering group, Bebras and Kestral
Chris Roffey discusses some of the challenges in assessing computing, and illustrates how the use of multiple choice questions can provide one solution to these. He'll demonstrate CAS's Project Quantum national item bank of crowd-sourced multiple choice questions, and discuss how teachers can get involved with this work through curating questions into quizzes as well as writing their own questions. Suitable for KS2 - 5

1g N==2 Communicating micro:bits with Python – Led by David Williams, Lecturer in Secure Systems, University of Surrey
This session is based on extra-curricular coding hub sessions delivered to Year 8 and Year 9 Woking High School students by the University of Surrey. With as much coding support as needed (absolute beginners are welcome and encouraged) we will enable students to communicate wirelessly across the classroom using their micro:bits. We shall also see how this can be used to teach decomposition, addressing, codes and/or ciphers, e.g., how and why might we prevent eavesdropping? While Surrey's two sessions are related, you can attend each session independently of the other. Suitable for KS3

SESSION TWO WORKSHOP CHOICES (11.45 – 13.15)

2a Expectations of the NEA – Led by Ceredig Cattanach-Chell, OCR
A look at the new NEA Guidance that OCR have released. Suitable for KS4

2b The Future of Micro:bit – Led by Gareth James, Chief of Education and Strategy, The Micro:bit Foundation.
In this hands-on workshop find out what is happening to the current programming languages, how they will be evolving into JavaScript Block Editor (PXT) powered by MakeCode and how to port existing code. We will also look at how the micro:bit can used to go from KS3 to KS5.

2c Bloodhound Race for the Line – Led by Aulden Dunipace, The Learning Partnership
Compete in teams to design, code and manufacture a model rocket car with a micro:bit accelerometer on board to gather vital data to modify and improve the designs. The workshop will culminate in in the teams racing their rocket cars against each other through a set of timing gates. Suitable for KS3 – KS5

2d Training the trainers – CAS Tenderfoot – Led by John Woollard, CAS Tenderfoot coordinator, teacher trainer and researcher, University of Southampton.
Do you need to support colleagues as they get to grips with the new content of computer science? CAS Tenderfoot is a set of CPD activities based on a deep computer science content, illustrated with classroom activities suitable for key stage 3 teachers. The session will illustrate 2 of the units related to algorithms and theoretical computers. The activities will give an understanding of the algorithms of the internet and how a Turing machine works. Suitable for potential trainers – ideal for CAS Master Teachers.

2e KS5 Functional Programming – Led by William Marsh, Senior Lecturer in Computer Science, Queen Mary University of London
This session will introduce FP, contrasting it with Imperative Programming. What is programming? When we leave out assignment (and loops), how can we still write programs? We will look at very simple examples using Haskell (no prior knowledge assumed), contrasting it with familiar languages (Python, Java, C etc) and explaining how FP ideas are now part of many imperative languages. Finally, we will try to convince you that there are reasons to take this approach to programming seriously. Some understanding of recursion (in any language or none) is a useful prerequisite (but not essential). Suitable for KS5.

2f Getting your pupils to transition smoothly from visual programming languages to Python – Led by Mursal Siyid, CAS Master Teacher, Prospect School
This workshop is about teaching programming to KS3 and KS4 using Python. It will involve discussion on approaches and exploration of resources available as well as completing programming exercises. The workshop is focused on transitioning into Python from Scratch and other visual programming languages. No previous experience of Python is assumed. Please bring your own device with Python installed. Suitable for KS3 and KS4

2g An Introduction to Java – Led by James Clarke, CAS Master Teacher, Frensham Heights School
This workshop with introduce delegates to the programming language Java. We will look at syntax for Variables, Output, Input. We will also explore the logic and syntax of selection statements and count / condition controlled iteration. If there is time I will also introduce classes and objects. Suitable for KS4.

SESSION THREE WORKSHOP CHOICES (14.00 – 15.30)

3a Delivering NEA for the Edexcel Computer Science GCSE – Led by Tim Brady, Edexcel
This session will review the spec, the controlled conditions, running assessing and tracking the NEA and will include provide teachers with helpful tools and tips for this aspect of the qualification. Suitable for KS4.

3b Teaching Computer Science without a computer – Led by Charly Lowndes, AQA
This session will explore ways to design lessons about writing, testing and improving computer code, but without using hardware. This will be loosely coupled to the AQA GCSE Computer Science course. Suitable for any level but perhaps most closely aligned to KS3 and KS4.

3c Bloodhound Race for the Line (repeat session) – Led by Aulden Dunipace, The Learning Partnership
Compete in teams to design, code and manufacture a model rocket car with a micro:bit accelerometer on board to gather vital data to modify and improve the designs. The workshop will culminate in in the teams racing their rocket cars against each other through a set of timing gates. Suitable for KS3 – KS5

3d Data transmission and coding – Led by Keith Buncle, CAS West Midlands
This session uses Binary Boxes for data transmission and coding. We look at asci codes and pictures coding and how this is sent in binary. We will also look at the protocols needed to make the link work and essentially mimics TCP. Suitable for KS2 - KS5

3e GUI Programming in Python – Led by William Marsh, Senior Lecturer in Computer Science, Queen Mary University of London
Python is a popular language for elementary programming but it not so easy to write programs with a graphical user interface (GUI). This workshop will introduce GUI programming in Python, covering the concepts common to all GUI frameworks: events, widgets and attributes. We will look at the role of object-oriented programming in GUI development, and how it is minimised. We will explain that Python has a choice of GUI frameworks but will look mainly at Tkinter, the simplest. The materials include a sequence of practical exercises: we will do some, leaving others for further study after the workshop. Knowledge of basic Python is assumed. Suitable for KS5.

3f System Security - SQL Injection and Network Forensics – Led by Rob Blair, CAS South East
An introduction to Network Forensics looking at legal requirements, procedures and advisory organisations followed by website and database hacking through Fuzzing, SQL Injection, XSS using a locally hosted site i.e. no server access required. Suitable for KS3 – KS4

3g Micro:bit timing-gate – make & take – Led by Kevin Sait, Microsoft UK Education.
A practical session using micro:bits to create and program a simple timing gate that can be used in the classroom. The session will look at how to program the timing-gate using PXT and consider utilising the system features on the micro:bit such as the processor clock. Suitable for KS3 – KS5.

SESSION FOUR WORKSHOP CHOICES (15.30 – 16.30)

4a Personal Cyber Hygiene – Led by Patrick B, Cyber Security Outreach, National Cyber Security Centre
There are simple things anyone can do to avoid taking unnecessary cyber risks with the technology they choose to use. This talk will cover some basic tips, the technical background explanations as to why they are useful, as well as their context to the cyber security elements of the Computer Science GCSE. Suitable for KS2 – KS5

4b Engaging young women in the computing classroom (repeat session) – Led by Emma-Ashley Liles, CAS #include and Stemettes
Practical advice about engaging young women in the computing classroom based on Google and NCWIT research. Suitable for KS3 – K35.

4c Enticing disengaged learners in KS3 – Led by Yota Dimitriadi, University of Reading and Teresa Verney-Brookes, Outside the classroom specialist
This session aims to share ways to introduce computational thinking using the outdoors. It builds on inclusive work done with KS2 classes and could be applied to KS3. This cross-curricular approach has supported the participating students' engagement and learning in fun ways with particular successes on students with SEN-D. Suitable for KS3.

4d How networks work – Led by Keith Buncle, CAS West Midlands
This session is linked to the 'Data transmission & coding' session. Having got the fundamentals of networking, the session looks at how networks hang together with routers and switches connecting the ISP and the Internet. Software called packet tracer* (free for schools) will be used and safety issues will also be included. There will be opportunity to build a virtual network. *also incorporated into a free course covering the Networking and Communications strand of the Progression Pathways – see http://cs.co/ComputingForSchoolsCourse Suitable for KS2 – KS5

4e Simple Programmable Robotics Using the BBC micro:bit (repeat session) – Led by Kevin Spurr, Kitronix Ltd
Learn how to create and program simple robotic buggies using the BBC micro:bit. The buggies will first be coded to run on their own and you will also learn how to control them wirelessly using a second BBC micro:bit or mobile device (phone or tablet). Suitable for KS3

4f Building a GUI in Java – Led by James Clarke, CAS Master Teacher, Frensham Heights School
This workshop with introduce delegates to Java's *Swing* library. We will explore as many of the elements of this library as we can during the time allocated.
Delegates wanting to book this workshop should have basic knowledge of Java and OOP.
Key Stage: This workshop is suitable for preparation for teaching Key Stage 4 and Key Stage 5;

4g N>2 Networking micro:bits with Python – Led by David Williams, Lecturer in Secure Systems, University of Surrey
This session is based on extra-curricular coding hub sessions delivered to Year 8 and Year 9 Woking High School students by the University of Surrey. With as much coding support as needed (absolute beginners are welcome and encouraged), we will program a LightsOut puzzle game across a wireless network of 25 or more micro:bits. We shall also see how this can be used to teach decomposition, addressing and/or networking. While Surrey's two sessions are related, you can attend each session independently of the other. Suitable for KS3.

If you have any queries, please contact Suzy Gray sg2@soton.ac.uk or 02380 592624.