

Upcoming Events Include:

25 October 2017
GRADnet Induction for 1st year PhD students. All new students are expected to attend. Park Crescent Conf. Cent., London

14-16 February 2018
GRADnet Winter School "Columbia's Final Mission" Cumberland Lodge, Windsor Great Park

21-23 March 2018
Student Led Conferences, "From micrometres to megaparsecs" and "Advances in high energy physics and cosmology", University of Southampton

2-5 July 2018
GRADnet Summer School, "Where will my physics take me?" Herstmonceux Castle, East Sussex

A full list and details are available on the SEPnet website and GRADnet VRE:

www.sepnet.ac.uk

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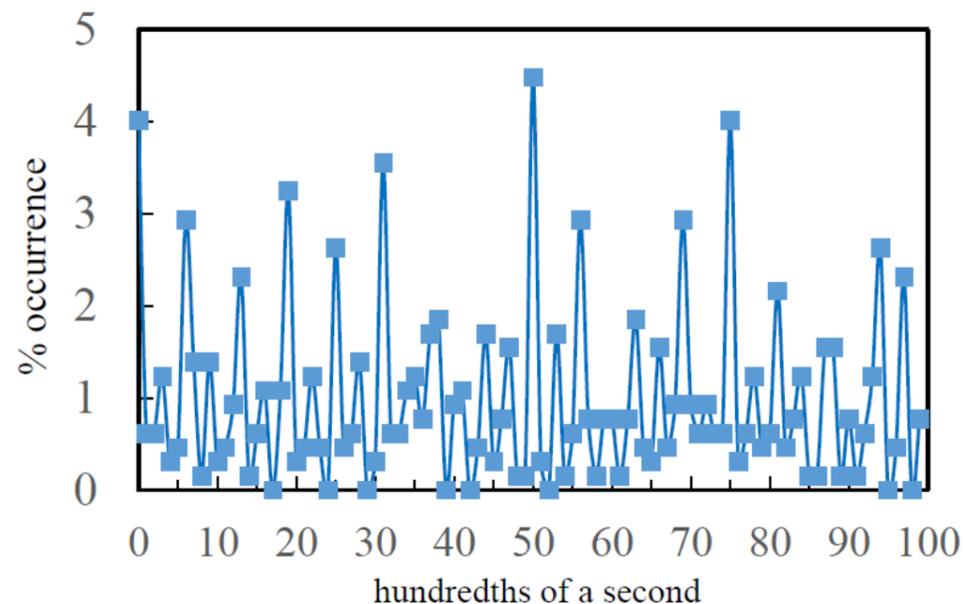
GRADnet
South East Physics Network

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Can you trust your measurement?

Physicists are used to making measurements using digital read-out devices; scales or stopwatches for instance. But can you trust the output?

I act as a time-keeper at swimming galas, collecting and processing the manual times recorded by timekeepers using stopwatches. My job is to collate the times which are sent through to Swim England, the national regulatory body, to determine if swimmers have achieved county qualification thresholds. Hundredths of a second can separate success from failure. All the timekeepers have watches with digital read-outs.



I noticed at one recent gala, however, that there was a larger than "expected" number of times ending in "00" (e.g. 1:15.00, 45.00, etc.) – 15 occurrences when 3 were expected. Significant? The figure shows the percentage of occurrences of hundredths of a second, whereupon it becomes apparent that not only 00 but 25, 50 and 75 hundredths (and others) are also strangely frequent. Obviously a 1% occurrence is expected. Note also the regularly-spaced preferred stopwatch outputs!

Time to call in a statistician - Dr Janet Godolphin. A Pearson χ^2 test (for goodness of fit) later, Janet explained that a test statistic exceeding 125 would indicate that the data deviated from the "null hypothesis" – the expected 1% occurrence for each hundredth. "What is the test statistic?" I asked. "740!" she replied. In short, these results are statistically impossible from a properly-functioning stopwatch.

Yet the data is collected from up to 6 stopwatches, with different timekeepers, over two different events.

How can this happen? Answers on a postcard please!

David Faux (d.faux@surrey.ac.uk), Department of Physics and Janet Godolphin, Department of Mathematics, University of Surrey.



GRADnet

NEWS FROM THE SOUTH EAST ENGLAND PHYSICS GRADUATE SCHOOL

Issue 7: Autumn 2017

Moving Forward

Following the success of the Induction Day for new PhD students last year, GRADnet has launched a new follow-on event for 2nd year students in 2017/18. All SEPnet Departments are behind this initiative and require 2nd year PhD students to attend unless they have strong reasons not to (e.g. they are at CERN that week).

Called "Moving Forward", the new event will be held on Wednesday 18th October 2017 at Park Crescent Conference Centre, Great Portland Street, London. It comprises of 5 workshops, and as with the induction day, students can pick two: one in the morning and one in the afternoon. The workshops focus on topics to help students with the challenges many face in the middle of their PhD and as they start to think about where they go next. The five workshops on offer are:

- **Creating impact.** Thinking about how to commercialise your research, or an idea, and turn it into an exploitable product or service? Perhaps you are interested in a career in business or knowing how businesses are created. Would you like to start thinking like an entrepreneur, or as someone that wants to change the world through innovation?

- **How to write a successful Fellowship Application.** This workshop is aimed at those students who are considering an academic career. Most often this starts with a period of post doctoral study during which the researcher is supported by a Fellowship. The workshop focusses on what is required to prepare a successful fellowship application.



- **Research data management.** Research data management is increasingly important in all fields of research. Presented by research council and university experts, this workshop asks what is required for good data management and examines some of the common problems and issues that researchers face.

- **Unconscious bias.** Few people think that they are unconsciously biased. Yet white males and many non-white students perform less well in their degrees than white females while females rarely get to the top of their profession - is this bias in the assessment and promotion systems?

- **Writing better software for research.** Whether you have 10 lines of shell script, or 10,000 lines of C, the quality of your research, and reproducibility of your results, depends upon the quality of your code. This workshop explores the attributes of good code, discusses blockers, and presents practical tools and techniques that help you to write better code, in less time, and with less effort.

To register for "Moving Forward" visit the VRE or go direct to <https://www.eventbrite.co.uk/e/gradnet-moving-forward-for-second-year-students-18-october-2017-registration-34745841748?ref=ebtn>

New for 2016/17

The Virtual Research Environment, the web-home of GRADnet, has been revamped this year with a cleaner, easier to navigate front page. In addition, the public material that does not require login protection is also available on the main SEPnet site (www.sepnet.ac.uk). As you come to book your place on events, you will find a simplified process using Eventbrite in place of BrightOffice.

SEPnet-3 announced

At the September meetings of the SEPnet Collaboration and Steering Boards made up of Heads of Departments and University Senior Managers respectively it was agreed that SEPnet-3 will go ahead seamlessly at the end of SEPnet-2 next July. This means that the future of GRADnet is assured for the duration of all those currently registered for PhDs including the new intake. This is great news as we start to plan the 2018/19 programme even before the 2017/18 programme is underway. If you have any ideas as to how we can make GRADnet even better, then please let us know.

Working together to deliver excellence in Physics

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First joint GRADnet-DISCnet Workshop a Success

There was a real buzz at the DISCnet workshop in Liphook held 18th-20th September 2017.

This event marked the start of a new venture for SEPnet, being the inaugural training workshop for our new STFC funded Centre for Doctoral Training in Data Intensive Science, DISCnet. Open to all GRADnet students it had been “sold-out” since shortly after the places were announced with 35 students attending. The delegates included almost all “core” first-year DISCnet students, many non-core and some old hands from across GRADnet. The first day saw introductions to DISCnet (Seb Oliver) and its placement scheme (Bob Nichol) and some external perspectives of the wider and rapidly growing importance of data science from business (Demelza Farrer— IBM-UK, Deepak Matani — Pivigo) and academia (Chris Miller — Univ. of Michigan Data Science Institute) before moving onto more technical matters looking at packages and tools that are in use in various research fields

The Old Thorns Golf and Country Estate, where the workshop took place, was as popular as ever.



DISCnet students getting down to work.

And the student feedback?

“Great event - I’m really glad to have been taught those programmes before the start of my PhD! Also good to meet the other DISCnet people. Cheers!” was the verdict from Heidi Thiemann while Sam Rowley said,

“Very much enjoyed this first DISCnet event, looking forward to attending others even though I’m not a core DISCnet student!”

GRADnet Summer Schools: The Employer Perspective

Each year we run two residential schools, in February and July. The summer school, GRADnet’s flagship event, focuses on how you can use the knowledge and skills gained from your doctorate outside academia. We lay on a variety of workshops, consultancy challenges, employer talks and opportunities for networking with employers as well as fellow students. This involves a great deal of organisation behind the scenes, as well as significant employer input on the day and before. So what do employers get out of the summer school and why do they get involved?



Mark Patton leading the Oxford Instruments workshop.

Julian includes an interactive exercise for students focused on spotting and defining inventions in terms of patent drafting. Workshops allow time for participants to work on a problem solving exercise which simulates a typical project or work-based situation, so that they get a real insight into the work area.

One speaker, Mark Patton from Oxford Instruments (OI), has devised an exercise to simulate a production line for ultra-low temperature cooling systems. Students get a real feel for the practical constraints that underlie manufacturing and the need to plan ahead/communicate with all parts of the production process. Mark, a physics doctorate, has always worked as an engineer at OI and believes it’s vital that people in his role have a good appreciation of what the client wants.

So, whether it’s raising awareness of a sector or specialism, getting access to a suitably skilled/qualified audience or simply giving something back to the HE community, the summer school is a real ‘win-win’ formula for both employers and students.

GRADnet Schools remembered: Were you there?



Summer 2015/16 at Herstmonceux Castle



Summer 2013/14 at NPL



Winter 2016/17 at Windsor Great Park

GRADnet programme 2017-18

For those that have not yet seen it, the full 2017/18 GRADnet programme is now published. Here is a quick summary. For full details, follow the links to the SEPnet website, GRADnet and the VRE.

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| 18-20 Sept. 2017 | Introduction to Data Science | Old Thornes, Liphook |
| 18 Oct. 2017 | Moving Forward for Second Years | Park Crescent Conf. Cent., London |
| 25 Oct. 2017 | GRADnet Induction | Park Crescent Conf. Cent., London |
| 8 Nov. 2017 | Connecting Industry with Physics Researchers | Hallam Centre, IOP |
| 14-16 Jan. 2018 | Numerical Modelling in Condensed Matter School | Old Thornes, Liphook |
| 14-16 Feb. 2018 | GRADnet Winter School | Cumberland Lodge, Windsor Great Park |
| 21 Feb. 2018 | PhD Recruitment Open-Day | Royal Astronomical Society, London |
| 5-7 Mar. 2018 | Observational Astrophysics School | Old Thornes, Liphook |
| 21-23 Mar. 2018 | Student-led Conferences | University of Southampton |
| 11-13 Apr. 2018 | Strong Correlations School | Old Thornes, Liphook |
| 24 Apr. 2018 | Science Communication Skills | Queen Mary, University of London |
| 25-28 June 2018 | VIII th NEXt Particle Physics PhD Workshop | Queen Mary, University of London |
| 2-5 July 2018 | GRADnet Summer School | Herstmonceux Castle, East Sussex |

Talk to most employers and there isn’t just one reason for attending. For smaller companies, such as MR Solutions and Fourth State Medicine, the summer school is a great way for employers to speak directly with students without the time/cost of running a formal graduate recruitment scheme. Peter Doughty explains: “We’ve found it very valuable to participate in GRADnet, both to meet groups of students with varied and valuable experiences/skills and as part of maintaining links with the academic community in general. There is always the opportunity for interesting discussions and cross-pollination of ideas, and the possibility of finding new future colleagues. And in my experience at least, it’s pretty good fun too.” Larger employers can benefit too. The summer school has helped DSTL, the UK’s Defence Science & Technology Lab, to raise its profile and dispel common misunderstandings about what it actually does.

For employers in niche areas, delivering a talk or workshop at the summer school is a great way to educate students about a different career path that might not otherwise get air time in the normal University Careers Service employer programme. As Russell Richardson of RBA Acoustics says, acoustics consultancy involves a lot of applied maths and physics and isn’t the ‘dark arts’ as some of his clients refer to it!

Julian Potter, Chartered Patent Attorney and Partner at WP Thompson, gets involved in the summer school primarily as a way of ‘giving something back’, but it is also a recruitment and ‘reach out’ opportunity.