

GRADPOST

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POSTGRADUATE INSTITUTE FOR MEASUREMENT SCIENCE

SUMMER

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PETER HOU

AND

KEIR MURPHY

DIRECTOR'S MESSAGE

"Lockdown can be a good opportunity for building up new skills"



Richard Burguete, NPL

It is with cautious optimism that I welcome you to this latest edition of GradPost, as our lives are changing again with the easing of restrictions, and as we prepare for new ways of working and studying over the next few months. From discussions with many of you, I know that you have had a wide range of experiences and have been affected differently by the Covid-19 pandemic over the past few months, adapting to the uncertainties and frustrations of being away from your colleagues and lab based research. It has been an anxious time for many, and we have all had to work hard to maintain motivation, whilst balancing new and diverse responsibilities. Despite all this, you have progressed with your work and maintained a positive outlook. Some of the articles in this issue are about your experiences, adaptations, and the positive actions you have taken to engage with some big challenges; all of which are a testament to how you have used your time constructively.

I hope that recent changes enabling a restart to lab work in Teddington will provide you with some encouragement that we are making progress to restore some form of normality (new or otherwise), and I hope you will also see that the PGI is keen to help and support you through a new mentoring scheme and career development activities.

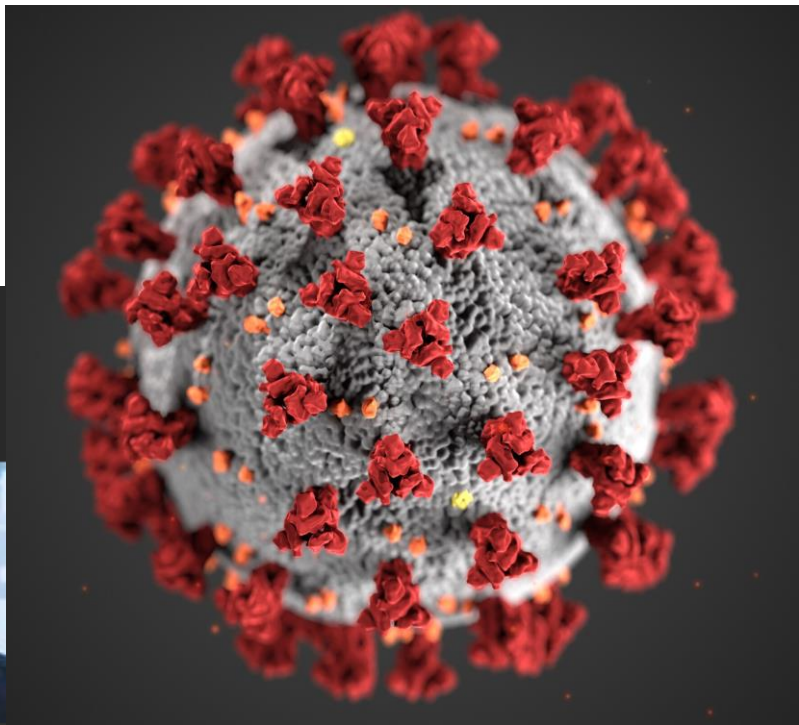
As part of this drive I encourage you, and your supervisors, to engage with our online conference in September, at which we aim to provide an attractive and stimulating programme of keynote talks, research presentations and discussions. The organising committee is working hard to put together the programme and I look forward to seeing you there.

You may also have noticed that GradPost has a new look. I would like to welcome our new Editors, Peter Hou and Keir Murphy, and thank them for the energy and great new ideas they have brought to this issue.

And finally, it is a great pleasure that we will be celebrating an important milestone for the PGI. The Five-Year Review shows how much we have all achieved as a result of the tremendous contributions, hard work and success of all our PGRs and supervisors. I look forward to sharing with you, in a celebration of the PGI over the coming months, how we have grown and developed over the past five years.

I hope that you continue to stay safe and healthy and can enjoy the summer as much as possible

A handwritten signature in dark ink, appearing to read 'Richard'.



SUMMER EDITION

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POSTGRADUATE INSTITUTE 5 YEAR REVIEW

SPECIAL REPORT



LEAH CHAPMAN



The Postgraduate Institute for Measurement Science



Five Year Review: January 2015—December 2019

Through training, research partnerships, and events, the visibility of the PGI has increased. During these five years we have illustrated that, as an entity focusing on the benefits of doctoral research in measurement science, we can have an impact on society. In carrying out our mission we have demonstrated widely the value of collaborative postgraduate training in creating future leaders for industry, academia, and beyond.

As part of our 5th Anniversary celebration we have produced a Five-Year Review which we encourage you to read by following this [link](#). The report was co-authored by members of the PGI team and the PGI Steering Committee (including Strategic Partner representatives) and was produced with the enthusiastic and dedicated support of Emma Braysher and Ben Webster, who designed and compiled a slick publication.

We are also always looking for case studies and examples of our students' achievements, so do get in touch if you have something to share.

The PGI was established in 2015 with three key objectives:

- **Enhance the science capability aligned with the UK National Measurement System and create demonstrable impact**
- **Develop a pipeline of researchers that are industry-ready**
- **Enhance the cohort experience of postgraduate researchers working in collaboration with NPL**

Since then the PGI has worked with its strategic partners, the Universities of Strathclyde and Surrey, as well as other universities and industry partners on our mission to bring together a coherent and integrated approach to the delivery of postgraduate studentship provision. This has led to an increase in the number of studentships, greater involvement of industrial partners, and the development of a programme of metrology and professional training tailored to PGR needs and aligned to business requirements.



PGI IN LOCKDOWN

CHALLENGING TIMES AND TIME FOR A CHALLENGE

Linden Fradet is the
University Liaison
Manager at NPL

I think we can all say these
past five months have been
the toughest of our lives,

whether due to the emotional strain we had to endure being separated from loved ones, or the physical exhaustion of juggling work, studies and life at home, managing meetings and children or caring for those in need; thanks to the Coronavirus, we are experiencing what is probably the biggest and most challenging change in our lifetime.

The Coronavirus has made its physical presence known, as we change our workplaces to accommodate its existence, and move apart from each other to stay safe, the mental impact is felt just as strongly. I for one, have struggled to balance everything, trying different ways to occupy our four year old daughter, managing workloads whilst keeping in touch with friends and family. Looking at the situation as it is, how can this be a time for more challenges? I guess the answer lies in what that challenge may be and why it's important to have one.

For me the challenge is always a personal one, a connection to someone I have met who has inspired me to do more and to be better. We all hold dear, the people in our lives who provide that inspiration. I know there are many at NPL, but I single out (as I know it will embarrass him) Andy Morris, who is doing the [Running Down Dementia](#) challenge whilst self-isolating, remarkable knowing that he has run some days on the spot! Other colleagues have set rowing challenges, completed the [Great Run virtual running challenge](#), the [30 day Mental Wellness Challenge](#) and in particular a 21 day [meditation challenge](#).



My challenge was to run and cycle 100 miles in May. I joined a friend's son [Charlie Kay](#) who has cerebral palsy and who easily covered the mileage on his adapted bike in hilly North Berwick. Thinking about Andy and Charlie gave me the push I needed to get out the door to do some exercise, when my head was telling me I don't have time, I'm too tired, or there's something I need to watch on Netflix!

Although I set this crazy target some months ago, I have continued to run and cycle. The benefits were noticeable to me very quickly; my mood lifted, I have more energy (surprisingly) and I have the headspace to think about work and home nursery more creatively than I did before. The correlation between exercise and mental wellbeing is well known, which is why I feel that now, more than ever, challenges should be set and continue for as long as we need them.

So I for one am up for a challenge during this pandemic. I wonder if after reading this, there will be any other takers? After all it's never too late to start a new challenge.

Notes

[Running Down Dementia](#) started on 1 April and carries on until 31 August. If you would like to join Andy's Army please email andy.morris@npl.co.uk

The [30-day Mental Wellness Challenge](#) launched on 1 May but can be started any time.

If you'd like to share your active or not so active challenge, please email pgi@npl.co.uk or get in touch and we can keep each other going.



A PHD STUDENT DURING THE LOCKDOWN

During these difficult times we must come together as a community to find ways around the unique challenges posed by the virus. One challenge encountered as a result of the lockdown, is the significant delays in lab work. This has caused a lot of stress, especially to final year PhD students.

In this issue of GradPost we interview a final year student at NPL (University of Surrey), **Ben Webster**. He was also a PGI Ambassador for the last few years, responsible for communications. He is now jointly running the new PGI mentoring scheme. (Page 14).

We have asked Ben a plethora of different questions, from academic-related to mental health and wellbeing. Also on how he spent his free time during lockdown.

Q1: How has the COVID-19 pandemic impacted your final year?

It has been a challenge trying to adapt. Lab work has been put on hold and I don't know when I will be able to start up again. It is difficult to plan for my post PhD. I do not know when the pandemic will end, so job searching has also been put on hold.

Q2: How have you managed time for your research project and daily routines during the pandemic?

I have tried to keep my days quite varied by not just forcing myself to sit down and write things towards my thesis all day. I've found breaking my days up with creative projects or going for a walk midway through the day quite beneficial. I have also accepted that some days will be more productive than others and on those less productive days, I often write a manageable to-do list. so I have a game plan ready for the next day.

Q3: Have you spent some time on learning other skills?

Yes, I used the free trial of LinkedIn learning. I focused on those courses which would aid my professional development and would hopefully better prepare me for my future career. I have just started learning German again on Duolingo!

A PHD STUDENT DURING THE LOCKDOWN



Q4: How have you maintained contact with supervisors and industry partners as well as social contact with family and friends?

For both personal and work, I've mainly communicated using video calls. Playing games online is helping too. I moved back to my parents' house before lockdown and this has helped the sanity a bit.



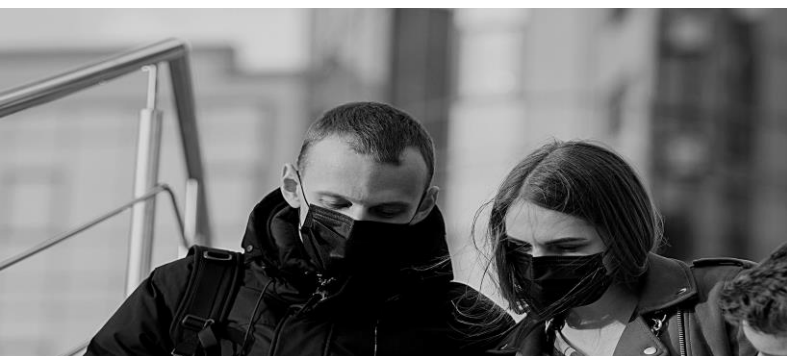
Q5: How has the pandemic affected your mental wellbeing?

It has been quite a challenge. I had the final six months of my PhD all planned out. I was expecting to finish around this September. And I was aiming to start job searching around July time. I was getting ready for the next stage of life!

Most of the plans have been put on hold and coming to terms with that was difficult at first. I am now trying to make the most of the extra time that I have between now and the end of my PhD to prepare myself for my future career.

About Ben Webster

A postgraduate researcher at the National Physical Laboratory and University of Surrey investigating the production, purification and molecular complexation of terbium isotopes for application in nuclear medicine.



HELPING COMBAT COVID-19

Mason Rowbottom

3D printing has played a key role in the UK, helping to keep medical staff and key workers safe since the start of the COVID-19 crisis.

A University of Huddersfield and NPL PGI student, Mason Rowbottom, is playing a part in the effort to assist in the COVID-19 crisis, through 3D Printing protective face visors. As Co-Founder of the National 3D Printing Society Mason and the team have managed to mobilise a network of makers throughout the UK to print protective face visors and thousands of volunteers, schools and businesses across the UK have supported not only this initiative but many others, including 3D Crowd UK and Makers 4 the NHS. Collectively these groups have helped to ensure that over 250,000 visors have been produced and distributed in just a few months.

It was inspiring to see how a community of engineers and makers came together in time of global crisis to make a real difference.

Other PGI students have been involved in similar activities to assist the Covid-19 effort. Minal Patel



helped to kick start the 3D printing initiative at the Teddington site. She collated resources and information to show the various ways in which 3D printing could be used to assist in this crisis, and worked with team members to develop a spreadsheet on inventory. Her work helped to streamline the organisation of this project and run more smoothly.





FIRST COMPARISON EXERCISE ON NORM

Emma Braysher

Nuclear metrology group has doubled the number of reference material available to researchers.

A PhD student joint-funded by the University of Surrey and the Nuclear Metrology Group has led the first NPL comparison exercise focused on naturally occurring radioactive material (NORM). There are a range of industries that produce NORM waste products that must be accurately characterised, including steel, titanium dioxide and oil and gas production. Despite this, there is only one NORM reference material currently available, limiting the ability of laboratories to develop and validate methods.

As part of her PhD, Emma Braysher processed blast furnace slag material provided by a steel company for a laboratory comparison exercise. The material was homogenised, and the radionuclides and stable element content measured at NPL.

Twenty-three labs from fourteen countries participated in the exercise, measuring three radionuclides (40K, 226Ra and 232Th). The exercise has essentially doubled the number of NORM reference materials available to end users, and the popularity of the exercise shows there is a clear need for further materials to be developed. A report was produced and distributed to participating laboratories, and is currently being written up as a potential publication.

The aim is for this exercise to be the first of a rolling programme of NORM comparison exercises. A second material from an oil pipeline has been characterised and will be advertised shortly, with potential future materials including titanium dioxide and sand.



LIFE AFTER A PHD

PLANNING FOR A SUCCESSFUL CAREER

Leah Chapman is the PGI Operations and University Liaison Manager at NPL

A PhD will grant you a distinguished qualification but will not guarantee you a job, especially in the current

climate. Building a career, be it in academia, industry, policy or other sectors will require you to consider different routes and positions along the way, but the principle remains the same; you must know and communicate your value and remember that it is a process that only you can own.

Most of you will emerge from your PhD with highly desirable skills such as your ability to learn fast, to be agile and adapt the parameters of your project, to think outside of the box and communicate to others. The rigor of PhD training in terms of research, analysis and adaptability is unmatched and gives you a head start in a highly competitive market, but there are still things you will need to do to stand out from other candidates with similar credentials.

Top of the list is to build your networks, LinkedIn and CVs are often the first impression you can make, so make sure that you keep both up to date and you actively engage in adding to it, but remember that they can only go so far.



What's more important is building your network of professional contacts by going to events (presenting is even better) and asking for introductions. Study carefully the delegates list and highlight who you want to talk to. Ask your supervisor to introduce you to others. Are there any alumni that pursued a career that you are interested in? Don't be afraid to ask - everyone has done it at some point in their career.

Always be prepared to pitch yourself so do have some key statements ready. What is it that makes me unique? What do people want to hear? Spin your messages according to your audience, what works in an academic setting might not work in a business setting. Study the language of the current climate, what the strategic context is? What is the political climate? What are the challenges my sector is facing? Showing affinity and knowledge make people relate to you more.

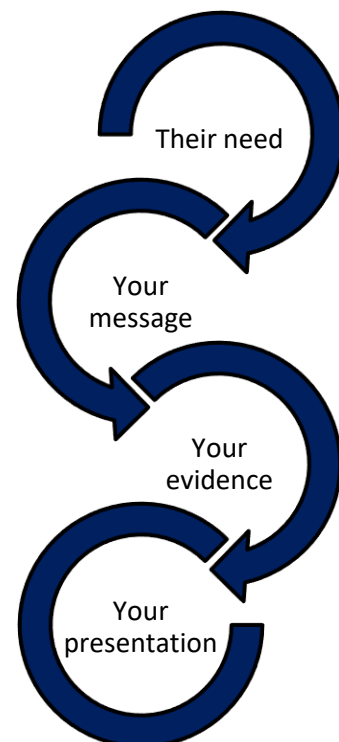


LIFE AFTER A PHD

You always need to research your next career move and know your competition. To do this start studying the classified sections or platforms that advertise jobs, punch high and look for something that you can apply for, a few years from now. What are the skills and attributes that this job needs? What steps do I need to take to get there? Once this is established look at the first position you can apply for and start building your CV accordingly. There are some great online tutorials on building a strong CV but I work on the following 4 principles:

1. **Their needs:** Do you know what their needs are? Find out as much as you can about the company and sector.
2. **Your message:** What are your best skills, experience, your knowledge? How is it relevant?
3. **Your evidence:** Show me, don't tell me! Remember evidence is what gives your message an impact. Use diverse examples and ask others to help.
4. **Your presentation:** You only have a few minutes to convince them to shortlist you, so keep it simple and use sections to highlight your strength. Many companies are using algorithms to sift the first round of applicants. So make sure that keywords from the job description and person specification are repeated in your CV and application.

Finally, remember that you have worked hard for this golden ticket called a PhD, so keep aiming high. As a student of the PGI, you have been trained by world leading experts, so be bold and do what you can to raise your profile. Employers will be lucky to have you.



TURNING WORDS INTO ACTION

Linden Fradet is the University Liaison Manager at NPL

In a recent Universities UK webinar hosted by Baroness Amos, three inspirational

speakers were brought together to discuss action to address racial inequality in higher education. Each speaker talked confidently and passionately about the change happening in the sector and in our world. The urgency was clear, following the tragic death of George Floyd and consequent outpouring and wide-spread support of the Black Lives Matter movement. Perhaps COVID-19 is driving changes in us all, this event highlighted the need for each one of us to play a part.

The speakers, Jason Arday (Durham University), Hillary Gyebe-Ababio (National Union of Students) and David Richardson (UUK & East Anglia University) were positive in their outlook but sceptical about the pace of change. Baroness Amos set the scene, acknowledging that progress has been made, *'but it's painfully slow'*. She went on to highlight complacency in the HEI sector and called for action, culture change driven by strong leadership and for conversations to be had on race.

The responsibility does not lie with Black or BAME students.

Jason shared the racial battle fatigue that many black and ethnic minority students and staff feel in tackling racial equality. The debate has gone on long enough. Many have shared their stories countless times, reliving pain over and over again. He urges an institutional approach with adequate resources to help with sharing good practices and encouraging all people to take ownership of the actions.

#Black Lives Matter

Hillary stressed the need to be humble addressing racial equality, an interesting yet uncomfortable thought. She urged delegates to ***'humble ourselves when we feel guilt, shock and shame'*** when hearing about injustice and prejudice. In response, we must be prepared to be radical and 'uproot and dismantle' existing systems, governance and in some cases beliefs.

David discussed the short and long term steps needed for changes to happen. Firstly to accept that there is a problem (with institutional racism in the sector). Partnerships within the academic community can lead to changes. Universities UK intends to drive the conversations and will launch advice and further support for leaders and UUK members in the Autumn. He encouraged ***"all students to play a part where they can; join conversations, discussion panels, groups within their network"***.

Playing our part in this is vital – ***'Do all we can, to all the people we can, in all the ways we can'*** is a quote that has stayed with me since this webinar. The PGI will shine a light on the issue of racial equality and the importance of BLM and bring this to the fore. We are in discussions with our strategic partners the University of Strathclyde, Surrey and our own EDI team to organize webinars for students in the Autumn. From this webinar, we now have action which will inform and influence the PGI for future generations of scientists and engineers.

If you would like to view this UUK webinar, please find the link - <https://www.universitiesuk.ac.uk/>

TRAINING

The PGI offers regular training courses and events for the PGI community throughout the year. During lockdown, training provision has increased to include on-line quizzes, drop-in support meetings, Supervision Charter sessions, and webinars covering a wide variety of topics.

New workshops are planned for the upcoming months. These aim to assist students in a more practical, tangible way in managing the effects of lockdown and other issues. To find out more please email pgi@npl.co.uk

MENTORING SCHEME

"Obtaining a Doctoral level qualification, such as a PhD or EngD, is about so much more than just academic progression – although this is obviously a very big part! A PGI mentor can help you to get the most out of your Doctoral Research period; boosting your skills portfolio and transferable experience" - Lewis Hill

The PGI has launched a mentoring scheme, designed to support PGI students throughout their doctorate. A mentor can be requested at any stage, anywhere between the first few starting months to submission and viva examination.

Mentoring allows for the development of confidence and communication skills, as well as strategies for dealing with professional, personal, and academic issues. The broad range of mentors will include existing PGI students, PGI alumni, and researchers from across academia and industry, which allows for the support of every aspect of PGR experience.

If you are a PGI student and would like to have a mentor for any aspect of PGR life, then please fill in this form - [link](#).

If you would like to sign up to be a mentor to a PGI student, then please fill in this form - [link](#). We will, of course, provide you with some guidance to help you develop as a mentor.

For now, if you have any questions or would like more information then we'd love to hear from you, so please get in touch with the ambassadors leading this programme - Dannielle Cox-Pridmore and Ben Webster at pgiambassadors@npl.co.uk



5TH ANNUAL CONFERENCE SEPTEMBER 2020

NEXT GENERATION

METROLOGY

A VIRTUAL PLATFORM FOR INNOVATION

PGI online conference details

This conference will bring together delegates from industry, academia and policy makers to discuss current and future global challenges.

Conference Dates and Times

8 September – 11:00 to 13:00

Engineering Solutions for tomorrow's challenges

Keynote Speaker: Dr Rachel Cooke (MA Meng PhD CEng FICChemE), Senior Reliability Engineering Manager, Amazon Europe

15 September – 11:00 to 13:00

Metrology for the digital Age

Keynote Speaker: Dr Ramona Marfievici, Senior IoT Manager, Digital Catapult

22 September – 11:00 to 13:00

Carbon net zero

Keynote Speaker: Dr Rachel Cooke (MA Meng PhD CEng FICChemE), Senior Reliability Engineering Manager, Amazon Europe

29 September – 10:00 to 13:00

Career workshop

Keynote Speakers: Prof Karen Faulds FRSE, University of Strathclyde, Dr Yi Luo (BEIS), Dr Matat Jablon (Oxford Instruments), Mr Christian Jones (Nanoform) and Dr Sanjiv Sharma (Airbus)

How to Register

Please visit this [link](#) to register for the conference. The sessions are free to attend and are designed to be flexible so do join us for all or part of it.

Once you have registered, you will be sent calendar invites and details on how to join the sessions.

For any queries, please email pgi@npl.co.uk



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