



Centre for Energy



What I wish I knew before starting my PhD



NCL Workshop Booking

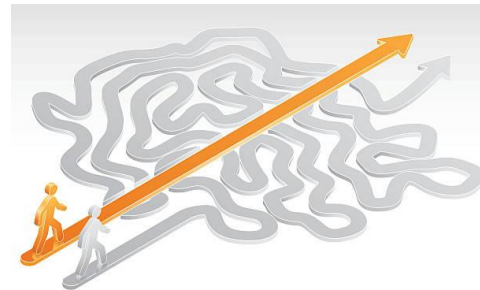
P.h. D. Student: Ana Carolina Coutinho Dutra (a.c.coutinho-dutra1@newcastle.ac.uk)
Supervisor: Dr James Dawson
Date: 20/10/2022

Who we are and why we are here today?

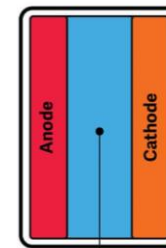


Centre for Energy

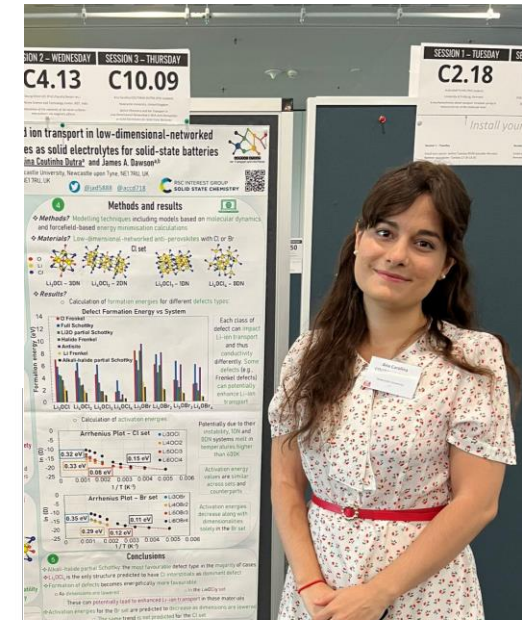
It's a Marathon not a Sprint.



Solid State Battery



Solid electrolyte



PGR Champion

Several of the **images** used within this presentation are **links** that will redirect you to **relevant websites**. Click on the pictures :D

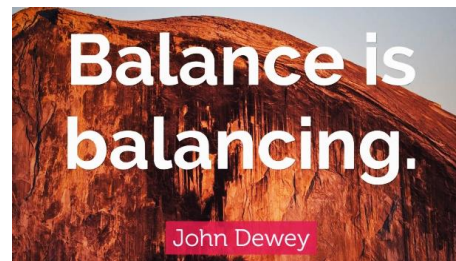
Summary - Division



You as a Student



You as a Person



Summary - Division

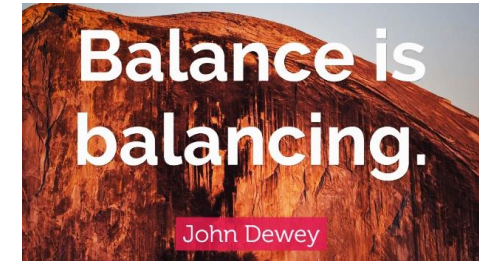
You as a Student

- Communication
- Research
- Demonstration
- Workshops & Skills
- Research Proposal
- NU My career
- Your PhD & Events – A happy tale

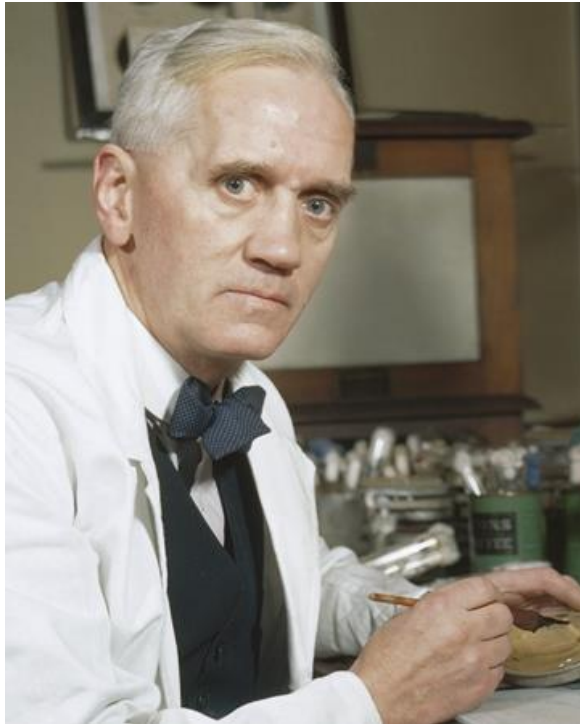


You as a Person

- Language Resource Centre
- Volunteering
- Impostor Syndrome
- Your Environment
- Daytrips from Newcastle
- Student Discounts!
- You & Events – A happy tale



Communication is key!



Alexander Fleming, 1943

ON THE ANTIBACTERIAL ACTION OF CULTURES OF A PENICILLIUM, WITH SPECIAL REFERENCE TO THEIR USE IN THE ISOLATION OF *B. INFLUENZÆ*.

ALEXANDER FLEMING, F.R.C.S.

From the Laboratories of the Inoculation Department, St Mary's Hospital, London.

Received for publication May 10th, 1929.

WHILE working with staphylococci a number of culture-plates were set aside on the laboratory bench and examined from time to time. In the examinations these plates were necessarily exposed to the air and they became contaminated with various micro-organisms. It was noticed that around a large colony of a contaminating mould the staphylococcus colonies became transparent and were obviously undergoing lysis (see Fig. 1). Subcultures of this mould were made and experiments conducted with a view to ascertaining something of the properties of the bacteriolytic substance which had evidently been formed in the mould culture and which had diffused into the surrounding medium. It was found that broth in which the mould had been grown at room temperature for one or two weeks had acquired marked inhibitory, bactericidal and bacteriolytic properties to many of the more common pathogenic bacteria.

CHARACTERS OF THE MOULD.

The colony appears as a white fluffy mass which rapidly increases in size and after a few days sporulates, the centre becoming dark green and later in old cultures darkens to almost black. In four or five days a bright yellow colour is produced which diffuses into the medium. In certain conditions a reddish colour can be observed in the growth.

In broth the mould grows on the surface as a white fluffy growth changing in a few days to a dark green felted mass. The broth becomes bright yellow and this yellow pigment is not extracted by CHCl_3 . The reaction of the broth becomes markedly alkaline, the pH varying from 8.5 to 9. Acid is produced in these conditions.



Me! Circa. 2012

At the Sherlock Holmes Museum (hence my costume!)

Communication is key!



1. Communicating your research = tricky!

- Many formats and each with **their own language**

- Two different **types of audience** (or three?)

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CHEMICAL REVIEWS

pubs.acs.org/CR

Physicochemical Concepts of the Lithium Metal Anode in Solid-State Batteries

Thorben Krauskopf,¹ Felix H. Richter, Wolfgang G. Zeier, and Jürgen Janek^{2*}

Cite This: *Chem. Rev.* 2020, 120, 7745–7794

Read Online

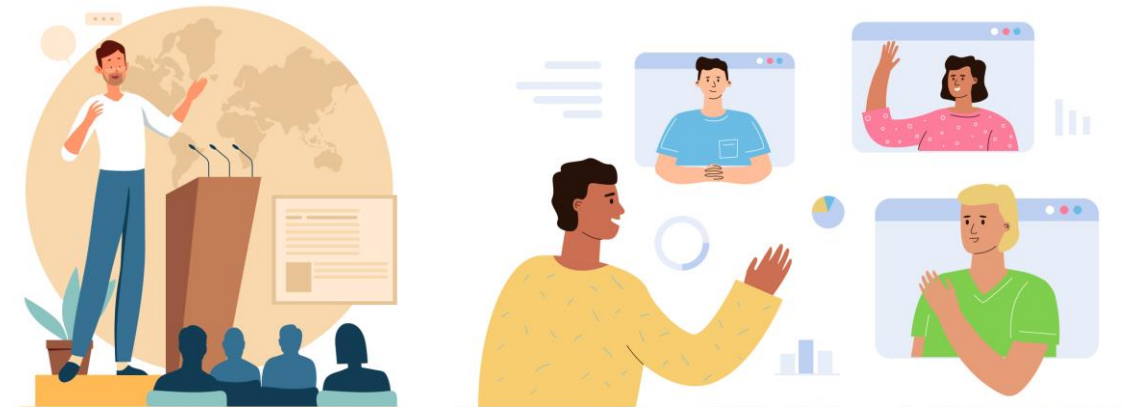
ACCESS |

Metrics & More

Article Recommendations

Supporting Information

ABSTRACT: Developing reversible lithium metal anodes with high rate capability is one of the central aims of current battery research. Lithium metal anodes are not only required for the development of innovative cell concepts such as lithium–air or lithium–sulfur batteries, they can also increase the energy density of batteries with intercalation-type cathodes. The use of solid electrolyte separators is especially promising to develop well-performing lithium metal anodes, because they can act as a mechanical barrier to avoid unwanted dendritic growth of lithium through the cell. However, inhomogeneous electrodeposition and contact loss often hinder the application of a lithium metal anode in solid-state batteries. In this review, we assess the physicochemical concepts that describe the fundamental mechanisms governing lithium metal anode performance in combination with inorganic solid electrolytes. In particular, our discussion of kinetic rate limitations and morphological stability intends to stimulate further progress in the field of lithium metal anodes.



The critical challenge

Methods and results

Conclusions

Why solid-state batteries (SSBs)?

Why anti-perovskites as solid electrolytes?

Future Plans?

Acknowledgements

References

The heart is in the electrolyte

Solid Electrolytes

Challenges to be overcome

- Strong **hygroscopic** nature;
- **Misconceptions** around their synthesisability;
- **Stability** issues;
- Interfacial **resistance**.

Advantages

- **High RT conductivity** (10^{-3} S/cm);
- **Wide electrochemical windows**;
 - **Low cost**;
- **Stability** against Li metal;
- Structural **versatility**.

Li-anti-perovskites

Z. Lu, C. Chen, Z. M. Ross, X. Chen, C. E. Johnson
Chem. Mater. 2019, 31, 1230–1235

“Please provide a research statement about your research. This statement will be read by **expert and non expert** reviewers so please write a statement suitable for **both audiences**”

Communication is key!



1. Communicating your research – how to prepare!

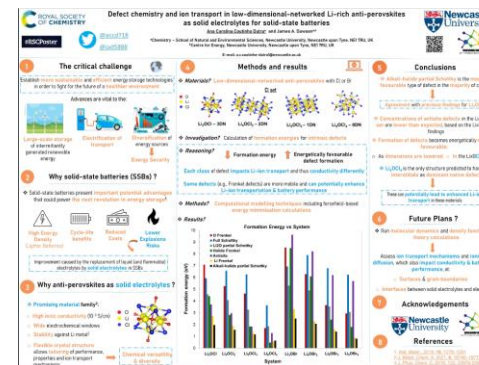
- Many formats and each with **their own language**

- Scientific Posters

✓ NCL Workshop Booking

What Makes a Good Poster?

Designing an Effective Research Poster



2022 #RSCPoster Twitter Conference
1 March 2022 12:00 - 2 March 2022 12:00, United Kingdom

[BOOK NOW >](#)

Filter By Programme: Filter By Workshop: Search on tags (and RDF labels):

Today

Tuesday, November 1, 2022 – Wednesday, November 30, 2022

Mon	Tue	Wed	Thu	Fri
09:00 - 10:00 Becoming an Open Researcher - Canvas Module	09:30 - 12:30 Managing Your PhD Online (ZOOM) Doug Folan Folan	09:30 - 11:00 RSC0202 Theory and Methods for XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	09:00 - 11:00 CASE STUDY: AN FEEMANOM XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	10:00 - 12:00 Clinical Researcher 2: Fundamentals XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood
10:00 Data Art Searching - Canvas Module	09:30 - 10:30 Presentation Skills (One to One) XRD & ICP-MS Learning Lab, Level 6, Henry Darby Lea Lockwood	11:00 - 12:30 Travel Abstract XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	10:00 - 11:00 Thinking Theories and Methods: From Online (ZOOM) Doug Folan Folan	14:00 - 16:00 Data Handling & Spreadsheet Skills XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood
10:00 Finding Information - Canvas Module	10:30 - 11:30 Presentation Skills (One to One) XRD & ICP-MS Learning Lab, Level 6, Henry Darby Lea Lockwood	13:30 - 14:00 Introduction to the Library and Academic Skills (ZOOM) Barbara Sharr Teaching Centre (BSC/B3)	10:00 - 13:00 Master XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	16:00 - 18:00 RSC0202 Information Skills - Canvas Module XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood
10:00 Finding Information - Canvas Module	11:45 - 12:45 Presentation Skills (One to One) XRD & ICP-MS Learning Lab, Level 6, Henry Darby Lea Lockwood	14:00 - 16:00 Understanding how to attend to a poster Barbara Sharr Teaching Centre (BSC/B3)	10:00 - 11:00 RSC0202: UNDERSTANDING YOUR QUANTUM CHEMISTRY XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	
10:00 - 11:00 Career Planning Part 1 XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood	13:30 - 14:30 Presentation Skills (One to One) XRD & ICP-MS Learning Lab, Level 6, Henry Darby Lea Lockwood	14:00 - 16:00 UNDERSTANDING YOUR QUANTUM CHEMISTRY XRD & ICP-MS Training Space, Level 6, Henry Darby Lea Lockwood		

Communication is key!



1. Communicating your research

- Many formats and each with **their own language**

- Slides Presentations

[NCL Workshop Booking](#)

[Presentation Skills Using Powerpoint **i**](#)

[Creating an animation of your Research **i**](#)

- ❖ What is your favourite slide? **Why?**
- ❖ What would you do differently? **WHY ?**



Communication is key!



1. Communicating your research

- Many formats and each with **their own language**
 - The written word

Registration for In-Sessional English (RISE)

INU7324	Writing	An overview of writing your Dissertation	22/11/2022	02:00	1	Select
INU7314	Writing	Writing the proposal for your dissertation	24/11/2022	02:00	1	Select
INU7334	Writing	Writing the Introduction & Abstract for your dissertation	29/11/2022	02:00	1	Select
INU7344	Writing	Writing the Literature Review for your Dissertation	06/12/2022	02:00	1	Select
INU7014	Writing	Successful Job Applications in English	25/01/2023	02:00	1	Select
INU7114	Listening	Dealing with unknown vocabulary when listening 1: Improving your academic vocabulary	25/01/2023	01:00	1	Select
INU9144	Writing	Writing for MPHIL/PhD students in HASS & SAgE (Part B)	30/01/2023	02:00	1	Select
INU9061	Listening	Listening & Speaking Practice Sessions (Part 3)	31/01/2023	02:00	1	Select
INU5055	Writing	Interactive Grammar Lectures	01/02/2023	01:30	1	Select
INU7134	Listening	Improving the accuracy and fluency of your spoken English	01/02/2023	01:00	1	Select
INU9081	Listening	Listening & Speaking Practice Sessions (Part 4)	28/02/2023	02:00	1	Select
INU7364	Writing	The Method Section of your Dissertation	10/05/2023	01:00	1	Select
INU7044	Writing	Intensive Dissertation Writing	12/06/2023	03:00	1	Select
2 INU7384	Writing	Writing the Results, Discussion and Conclusion Sections of your Dissertation	12/07/2023	02:00	1	Select



YOU SEE,
BUT YOU
DO NOT
OBSERVE



Communication is key!

1. Communicating your research

- Many formats and each with **their own language**
 - The written word

Registration for In-Sessional English (RISE)

RISE Home



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OBSERVE



❖ **Read** your favourites!

CHEMICAL
REVIEWS

pubs.acs.org/CR

Review

Physicochemical Concepts of the Lithium Metal Anode in Solid-State Batteries

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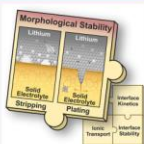
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❖ **Help** with phrases



Academic Phrasebank



Communication is key!



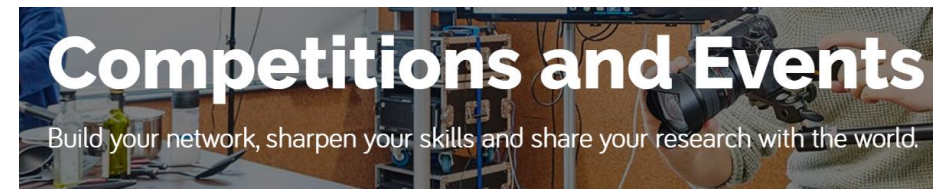
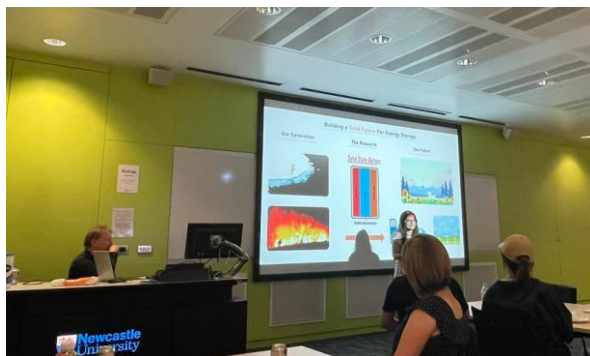
1. Communicating your research

- Many formats and each with **their own language**

- Talking... **OUT LOUD!**



❖ **P-R-A-C-T-I-C-E!**



Bright Club Newcastle
@ The Stand Comedy Club

Communication is key!



1. Communicating your research

- Many formats and each with **their own language**

- Talking... **OUT LOUD!**

❖ **P-R-A-C-T-I-C-E !**

❖ **Find opportunities to P-R-A-C-T-I-C-E !**



Communication is key!

1. Communicating your research

- Two different **types of audience** (or three?)

“Please provide a research statement about your research. This statement will be read by **expert and non expert** reviewers so please write a statement suitable for **both audiences**”

- **Advice #1**

- Write your research thesis (one for each audience type) in:
 - ❖ A sentence;
 - ❖ A Paragraph;
 - ❖ A Page (and make an extra of this for audience 3).

✓ **And KEEP IT!**



Communication is key!



1. Communicating your research

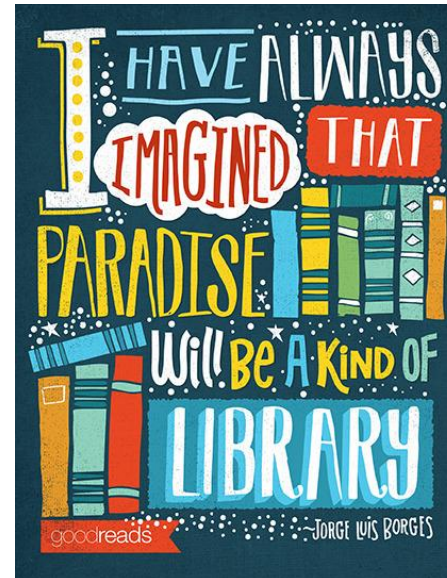
- Two different **types of audience** (or three?)
 - **Example**

I carry atomistic and molecular dynamics simulations to investigate the energetics of defect formation and Li-ion transport in a range of Li_xOX_y ($X = \text{Cl}$ or Br ; $x = 3-6$; $y = 1-4$) anti-perovskites with zero- to three-dimensional structures, in the context of their use as solid electrolytes for solid-state batteries.

I use computational programmes to predict how imperfections in the structure of different solid materials, which belong to a material family called anti-perovskites, can impact the way Li-ions can be transported across them. Good Li-ion transport is fundamental for battery materials and my research can predict which materials would be better to be used in batteries that are made only with solid materials.

2. Research Skills

- Literature Reading
 - ❖ Start with the **reviews** and make your way back to the past.
 - ❖ Read **abstract and conclusions first**. Now Introduction. **Is it relevant to your research ?**
Then dive into the methods and results.
 - ❖ Make a **Study Buddy** Document



2. Research Skills

✓ NCL Workshop Booking

- EDI
- Time Management
- Teaching
- PhD Life

Equality,
Diversity and
Inclusion
including PGR
support and
responsibilities
[i](#)

Professional Development:
Academic Time
Management [i](#)

Managing Your PhD [i](#)

Introduction to
Learning and
Teaching in
Higher
Education -
Workshop 1 [i](#)

Making
the Most
of your
PhD
Experience
[i](#)

PhD Life



2. Research Skills

✓ NCL Workshop Booking

- Coding

Writing your thesis in LaTeX



Matlab



- Software Carpentries – for HPC and Python

- Extra Funds Applications

Writing Persuasive Applications



Applying for Research Funding - Getting Started: PhD & Beyond



School of Natural and Environmental Sciences - Student Travel Bursary Application Form

SNES Community Canvas – 1 Year Lifecycle



3. My career



A screenshot of the Newcastle University MyCareer portal. The header is dark blue with the Newcastle University logo and the text "MyCareer" in white. Below the header, there are two dropdown menus labeled "Search" and "Book". A row of seven circular icons is displayed below the menus, each with a corresponding label: "Queries/CV" (envelope icon), "Events" (calendar icon), "Appointm..." (handshake icon), "Vacancies" (briefcase icon), "Work Expe..." (person with briefcase icon), "Forms" (clipboard icon), and "Pathways" (hexagon icon).



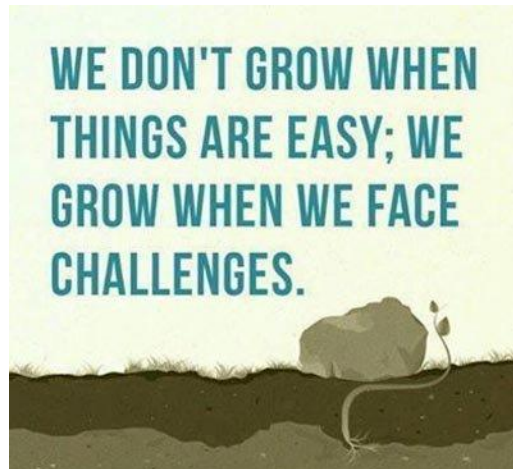
4. Your PhD & Events – A happy tale

- **GO !**
- Talk to **PEOPLE**, talk to **EVERYONE!**
- If others cannot go, **go anyways!**
- **BE NICE – everyone there also wants to have a good time!**
- Remember you are representing your research, your group and your uni.
- Each experience is different and things do take time to happen.



4. Your PhD & Events – A happy tale

- **But Ana, I am so shy....**
 - Visualize yourself networking before you go.
 - Act the way you would like people to act with you.



It **IS** hard, but this can be the difference between having a **GREAT time** or **feeling very lonely**.

Remember **practice makes perfect** and **things do take time**.

But some things are **REALLY** worth practicing for!



4. Your Environment

- **Be part of the solution**
 - Emails: **Thank people!**
 - **Compliment** people on their work; tell them what you loved about it
 - **Say hello** to people you know on the corridor
 - Be **HUMBLE**:



Be **mindful, critic and observant** of the **effect that gathering so much knowledge has on you.**

Do not forget that **you too once were a beginner** and that everyone can learn.

Be to your future 1st year colleagues **what YOU wanted** your colleagues to be.

Just because someone does not fully understand your research **it does not mean they cannot teach you anything else!**

5. Impostor Syndrome

Wellbeing4all: Coping with Imposter Syndrome

☑ NCL Workshop Booking

- The first step to anything new is **freaking out**.
- Remember that **the people who chose you to be here are very smart**.
- Remember **where you were** 4, 2 years ago and **where you are** now – you improved then and will improve much more!
- You did not get here **JUST** to get here.
- You are a **STUDENT**, you are **LEARNING**. If you were supposed to know all about your research already... then where is your Nobel Prize???



6. Student Union Events and Trips!



- If others cannot go,
go anyways!

20
Oct, 2022



Social Cricket

04:00pm | On-Campus

INFO

BOOK NOW

20
Oct, 2022



Social Netball

05:00pm | On-Campus

INFO

BOOK NOW

20
Oct, 2022



Ghostly & Grisly Newcastle walking tour

05:30pm | Off-Campus

INFO

BOOK NOW

20
Oct, 2022



Live Music: The Feeling

07:00pm | Venue

INFO

BOOK NOW

21
Oct, 2022




Lundgren Tours 3 day tour of the Scottish Highlands (Paradise)


06:45am | Off-Campus

INFO

BOOK NOW

7. Demonstrating

Introduction to Learning
and Teaching in Higher
Education - Workshop 1 

Introduction to Learning
and Teaching in Higher
Education - Workshop 2 

 NCL Workshop Booking

Communication is key!

- Sharpens your **empathy** and ability to deal with challenges **“on the go”**
- **Teaching Experience!**

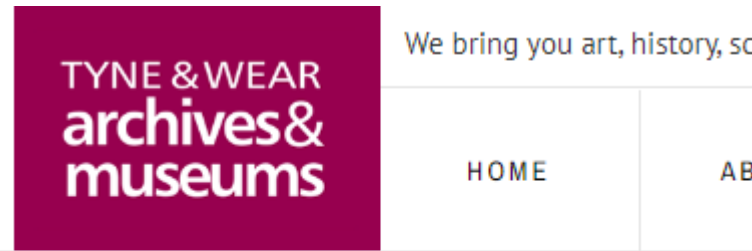


8. Volunteering

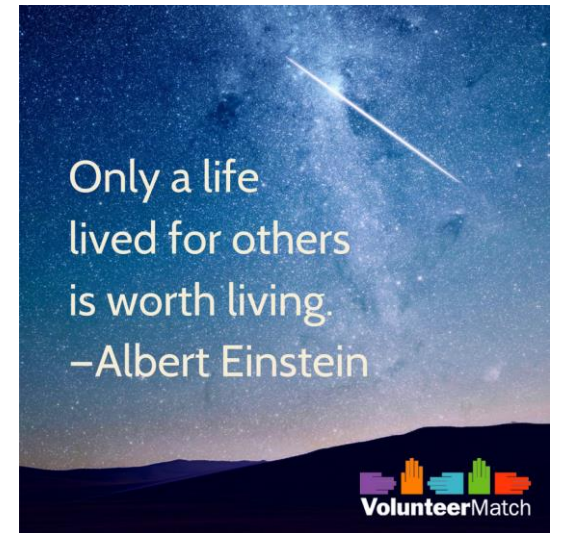


VOLUNTEERING

We are here to provide you with every opportunity to take on new responsibilities, working on your own personal development, and help support the local community.



Volunteering





9. Language Resource Centre

Language Resource Centre How to Join

Communication is key!

e-Tandem Partnerships

Distance & Online Resources

University-Wide Language Programme
We offer free language classes to all Newcastle University students.



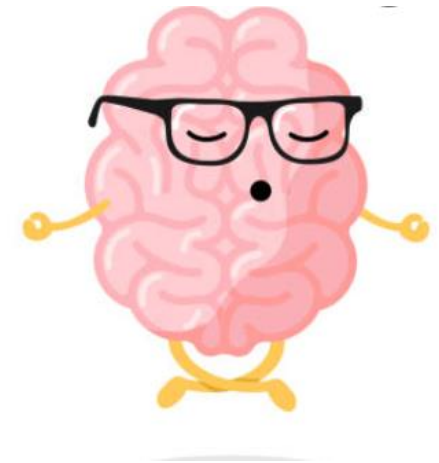
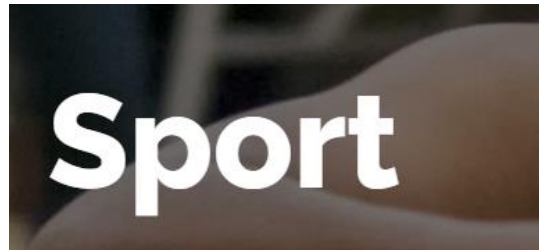
School & Institute Programmes

NIHR Newcastle Training School	Language Resource Centre
NUMedSD	Engagement Training

10. Mindfulness

Lunchtime Mindfulness 

 NCL Workshop Booking



11. Beyond Newcastle

Get a Railcard



Durham



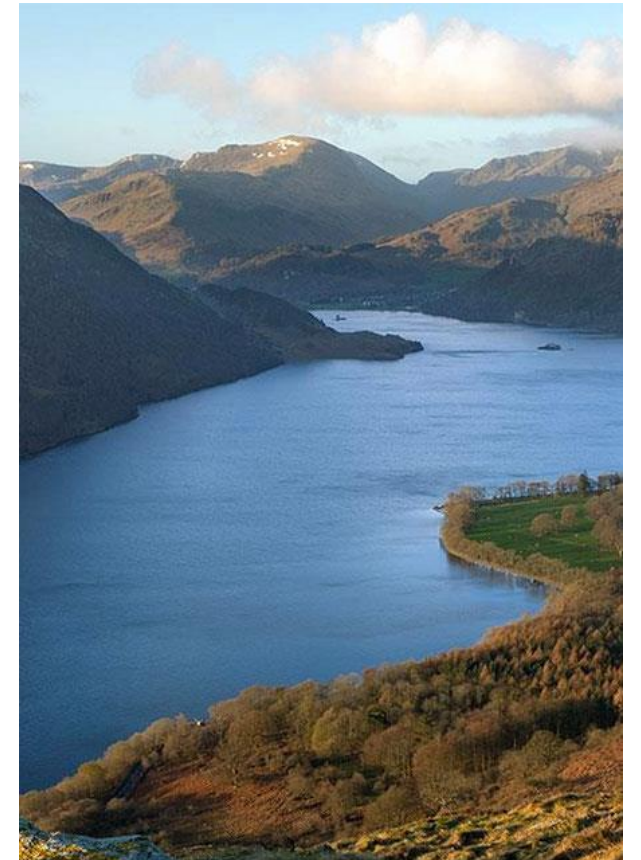
York



Edinburgh



Scarborough



The Lake District

12. Student Discounts!

UNiDAYS

StudentBeans

prime student

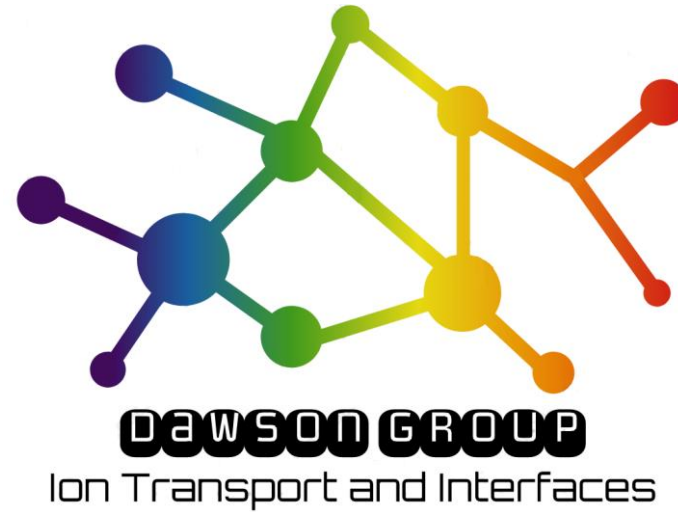


Remember



**YOU SEE,
BUT YOU
DO NOT
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Acknowledgements



Centre for
Energy



Rhiannon Lamb



Dr James Dawson



Olivia Colborn





Centre for Energy



Thank you! Questions?



NCL Workshop Booking