

Victory over the (foreign) Sun

READING TIME: 2 minutes 5 seconds (Based on an average reading speed of 275 words per minute)

Personal Growth through G0 - How G0 has influenced my personal growth



Defeater boxer, hands wrapped and ears of cauliflower... a bit how I'm feeling while I begin to reflect. "[Pugilatore in riposo Palazzo Massimo Rome Italy\(06\)](#)" by [rverc](#) is licensed under [CC BY-NC-ND 2.0](#).

We did it!

Here we are, post-outreach Charlie clocking in right now. What a rush! I want to talk a bit on the topic of limitations. Throughout G0, I've struggled to balance expectation and feasibility. I knew my project would be "average" and not groundbreaking but to me it was a trade between what I think would be best for my development while also hoping to do worthy work. My supervisors were always pushing me to add extra flair (have them work with real data). For me though,

empathising with the average S1 student. It would have been overwhelming given how much they'd have to learn just to get a grip on the material. To then apply that in a meaningful way in just 3 sessions (the 1st being taken up entirely with just setting up and gaining the knowledge to do the outreach).

Isn't there supposed to be calm before the storm??

I was so nervous the morning of my first session. I was pacing constantly around wherever I found myself to be: my kitchen @ home having breakfast, breathing heavy and slow during the commute to the school, nervous small talk with the office receptionists while I awaited Mr Cavers to come and collect me, all down to the wait as I stand there with my presentation slides open and the class shuffling in.

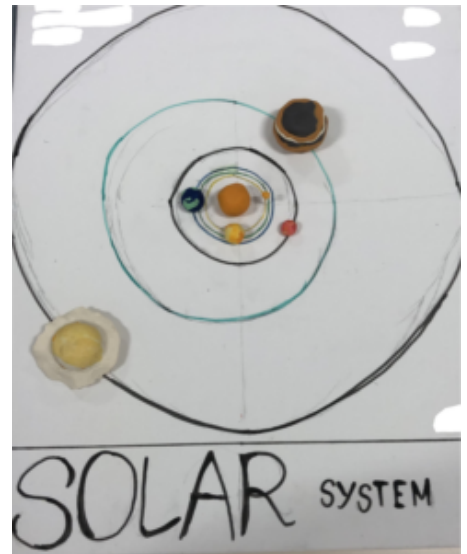
3.. 2... 1... "Right well I think we'll make a start" and with that, we were off.

I was nerve-ridden but as I spoke I felt the ice begin to melt away. There was a brief about what we'd be getting up to over the next 3 sessions before we begin our journey through our solar system. Learning and discussing all about stars, our sun, the planets, moons and life. I even set them homework!



Class' model of Gliese 581 system. *Own image,*

No Attribution Required



Class' model of our solar system. *Own image, No Attribution Required*

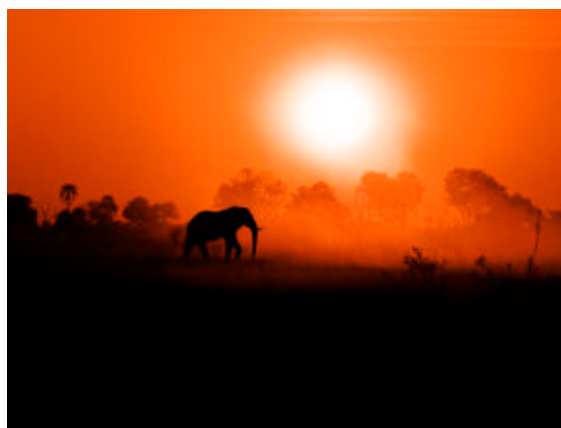
A sleepless week

It's funny because I think I predicted [sleepless nights](#) back

in October. I didn't have the luxury of time to spend reflecting and tweaking the remaining sessions, with every slide I presented and question I asked the class, I was constantly collecting data and tweaking my teaching in real time. The children went into their weekends having completed their models and come Tuesday we recapped all we had learned and every student produced their own exoplanet with fun facts + their own extraterrestrial inhabitants.

And in the end

As I walked home, wearing my space tie and holding my carrier bag of supplies, I couldn't help but gleam with pride. The semester hadn't been golden but G0 was the highlight of my entire degree. I had never taught an entire class before, only tutored individually. After this outreach though I really felt like my place in life was the classroom. It didn't just reassure me of my career path but cemented it. I know the write-up is to come and I know my project isn't extraordinary, but to whatever grade I might receive, my fulfilment is immeasurable.



Elephant walking at sunset.
“[Sunset](#)” by [najeerbkhan2009](#)
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Deep in the Interstellar medium (and trouble)

READING TIME: 2 minutes 31 seconds (Based on an average reading speed of 275 words per minute)

Working with clients and the Community - Facing a difficulty or dilemma



How many hourglasses can I flip before something has to change? "[Sands of time](#)" by [kerolic](#) is licensed under [CC BY-NC-SA 2.0](#).

How long was I out for?

Readers, I find myself with one of the wackiest weeks ahead of me and I couldn't be more relieved, terrified and excited. Let's rewind a bit just to figure out how we got here. I've been too preoccupied with other academic commitments. My supervisors had been slightly pushing me more and more over time to find my own client. I still always thought that they were just moments away from finding a client for me. As time went on I decided to speak with my former physics teacher, Mr Cavers. I asked him if he could help me find contacts for

finding local schools. I live in Glasgow and commute to Edinburgh for university and had a higher interest in Glasgow schools as, not only would it be more convenient but, Glasgow is [worse off](#) than Edinburgh. In the end Mr Cavers proved not to have the time to help me find clients. It wasn't until March 12th that I finally scheduled a phone call to sit down to discuss the possibility of delivering at Belmont House School. At this point I had run out of time, we concluded that with the easter holidays coming then there were only 5 possible slots left with the S1 class. With that we arrive now as I have 7 days to prepare 3 sessions...



It's gonna take some effort to unblock but I need to go forward.
[“Slight Roadblock”](#)
by [Kirt Edblom](#) is licensed under [CC BY-SA 2.0](#).

The stimulus can't stimulate

It was clear to me that I'd clearly left my Outreach on the back burner for so long and when it was time to pick it back up again, it was piping hot. Finally though, time to set things right and get back into the swing of things. Something

I'd not felt since the elevator pitches. I've known roughly what my plan is for a while now. 3 sessions with the first being a discussion and deep dive into space in lecture form. The third and final session introduces interdisciplinary teaching as we explore chemistry and biology in terms of supporting life. The second session though was meant to be this exoplanet transit experiment. During client negotiations I realised that the level of knowledge required is simply beyond where the students are at (Ohm's Law isn't introduced until [National 5 level](#)). This necessitated a re-think as I recall that my supervisor, JC, had sent me an activity from the Royal Observatory of Edinburgh. The activity was to do with exoplanet that involved [making a model extrasolar systems](#). I'd like to use it as a starting point and create my own version at the appropriate level while also keeping it engaging.



Time to look inward, self-reflection is the key to identify the next area of growth. "[Cincinnati – Spring Grove Cemetery & Arboretum 'Swan Reflected – Self Aware?'](#)" by [David Paul Ohmer](#) is licensed under [CC BY 2.0](#).

Pull yourself together!

The main difficulty was in the fact I was a 4th year university student at one of top schools in Scotland and I was so used to high expectations. I was worried about failing to engage the students. Seeking guidance, I reached out to peers with relevant experience. The first port of call was my former physics teacher but I also have a friend who's a paediatric speech therapist. Both offered their own insights but the overriding message was clear: "Make it fun!". It made so much sense and totally unclogged my creative constipation. Student engagement is linked to [deep learning, connection making and greater performance](#). Still, even with my materials ready, I remained worried about my time management. If the students don't engage with me then I won't have enough content. If I don't maintain a good pace then I won't get through all the content. So much anxiety, it's time to see if a career in education is meant to be.

Cheers,

Charlie

Project E.Q.U.A.L. is born

READING TIME: 1 minutes 59 seconds (Based on an average reading speed of 275 words per minute)

Reflections on a Challenge - What has made me rethink my project



Brain storm artwork. “[‘Brain storm’ \(©Viktor Hertz 2013, personal work\)](#)” by [Viktor Hertz](#), [CC BY-NC-SA 2.0](#), on Openverse.

Projecting About My Project

Hello again, my little blog! Last time it was noted that all I had was really just a first, single brainstorm to what my project could be. It had all stemmed from one particular experiment that sprung to mind. Now I’ve had some time to build more on the project and develop into something much more substantial. This has been partially forced by the fact I’ve had to write an interim report for the end of semester 1. We now have a title, a refined client choice, learning outcomes, linked E’s & O’s and rough outline for how the project will (hopefully) proceed during semester 2. Important to highlight these of course but the real purpose of this blog is to document the changes.

I've always been a sucker for acronyms so I've created: Project E.Q.U.A.L. (Extrasolar Query in Understand Astronomical Landscapes). The purpose is to make clear the area of science (physics) that the outreach will explore. An *equal* objective is that this project hopes to show that science is for everyone!



Reaching for the stars or raising hand to question the universe? "[Open Educational Resources: The Education Ecosystem Comes to Life](#)" by [opensource.com](#), [CC BY-SA 2.0](#), on flickr.

Reflection & Rebuild

From the week 6 workshop "Education, IDL and Storyline", I was introduced to the Broad General Education as part of Scotland's Curriculum for Excellence. From the workshop and talking with staff, it became apparent that it was (unofficially) discouraged to pursue the senior levels of S3-S6 which was my original plan. This was especially damaging to my original plan as I intended to incorporate an impact of preparing them for the transition from secondary to tertiary education. While this initially sucked, upon reflection I think this is a vital for my outreach and self-growth. I wanted to be with these students as it's a group I have experience from my tutoring.



Analog Hygrometer with a region noted as "Comfort Zone". "[Comfort Zone](#)" by [tmray02](#), [CC BY-SA 2.0](#), on Openverse.

(Dis)comfort Leads To Conditioning

I've realised now though that with this project, I need to get out my comfort zone! Clearly I had clear hesitance when it came to teaching science rather than physics, as S1-S2 have not specialised into a specific science(s) yet. Not only does this combat department tribalism that's ever present in high schools (as also mentioned in workshop) but helps open up the potential of my project. It has to also be noted that if I am to follow through and become a teacher then I do need the exposure in how to teach such a class. For with those S3-S6 pupils who have picked Physics, they will possess at least some want/desire to be in the classroom. S1-S2 on the other hand presents a real problem of making the lessons engaging and enjoyable as possible for those who'd rather be somewhere else. There are many great resources out there on how to achieve this but I strongly believe it all comes down to the interpersonal relationship and empathy.

Cheers,

(Out)reach for the stars!

READING TIME: 2 minutes 39 seconds (Based on an average reading speed of 275 words per minute)

Introducing myself, my hopes for Geoscience Outreach and reasons for participating



A certain happy tourist posing by the town name sign of Condom, France in January 2023 . *Own image, No Attribution Required*

Who Am I?

Let me briefly introduce myself. I'm Charlie and I'm a BSc Astrophysics student in my 4th and final year. When I finished school I knew I was headed to uni but I was split between physics and music. Choosing between the career-safe option or one of high risk and high reward. In hindsight maybe I should have been braver but I know for a fact that I'm glad that I've managed to keep music a hobby rather than work.

Why The Geosciences Outreach Course?

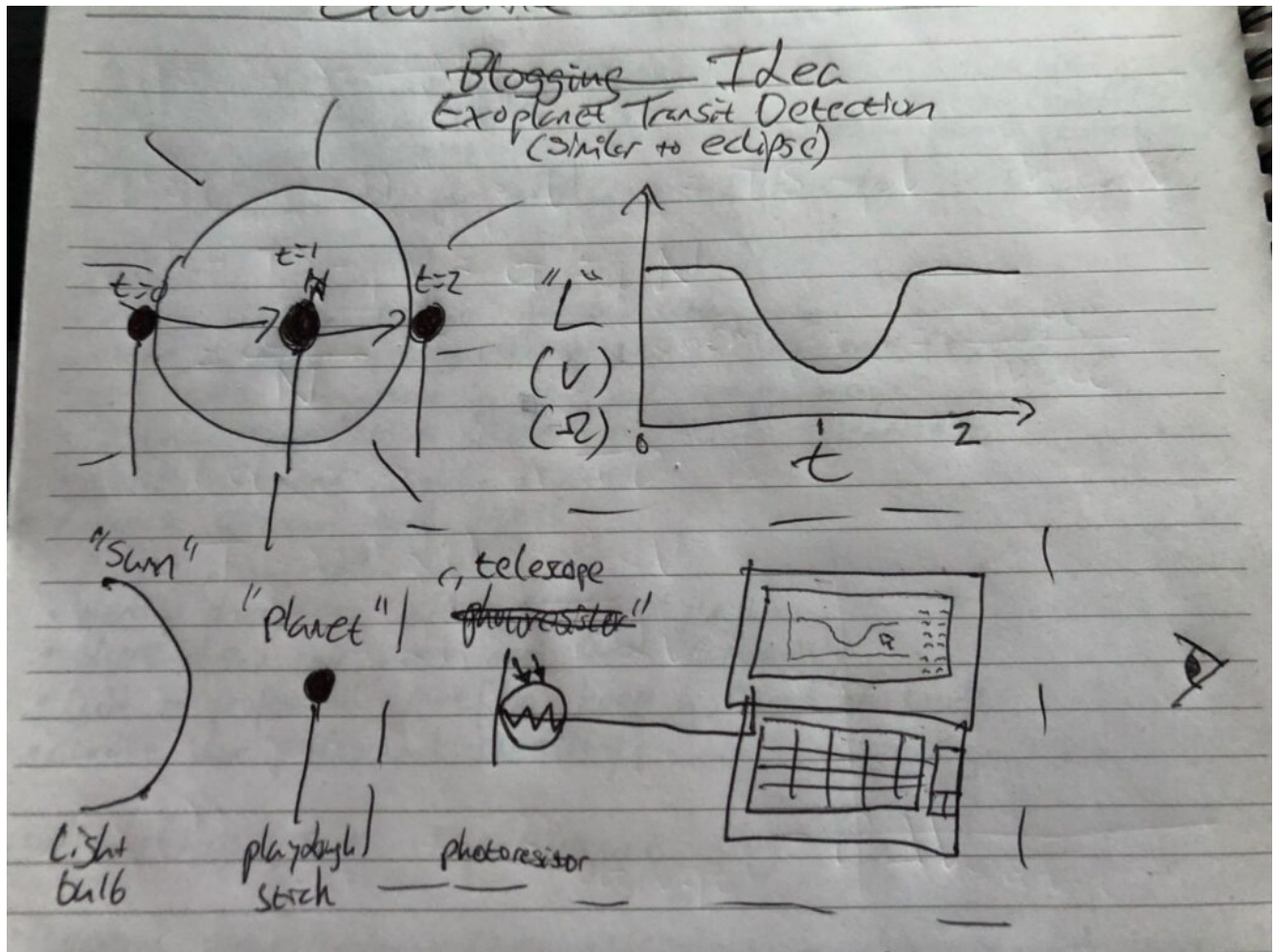
My passion for teaching physics ignited back in secondary school. Here in Scotland, as long as you attain the average entry requirements in your penultimate year then you're sure to receive an unconditional to university. Therefore in my final year of secondary school, I found I had the opportunity to tutor two students in National 5 Physics. While one was comfortable and capable, I got to witness the transformation of the other, a C-level student, into an A-level whizz whose progress made a serious mark on my sense of purpose. It was with this that I found my calling – to reach out to all physics students (both potential and current) and make them see the vibrancy and colour lurking inside the equations.

That's why I've embarked on the G0 course because I want to become a passionate and enthralling educator. My goal is to learn and grow as much as I can and mould myself into the best possible starting position for a new teacher, and this course is a pivotal period in that journey.

Unveiling The Secrets Of Exoplanets With Students

It's important to talk about my hopes for the G0 course. My project timeline begins with guiding students (in the S3-S6 range) on a galactic adventure. Together, I hope to unravel the stellar story of planet formation which is key to exploring the exoplanets. Before going on to view the methods deployed to detect them.

The concept for the project actually began with the stimulus of an experiment. Picture this: a light bulb "star", a playdough "planet", and a photoresistor "telescope". With these tools, we can monitor our exoplanet's eclipse across the host star, creating a transit graph of luminosity (in our case, resistance) over time.

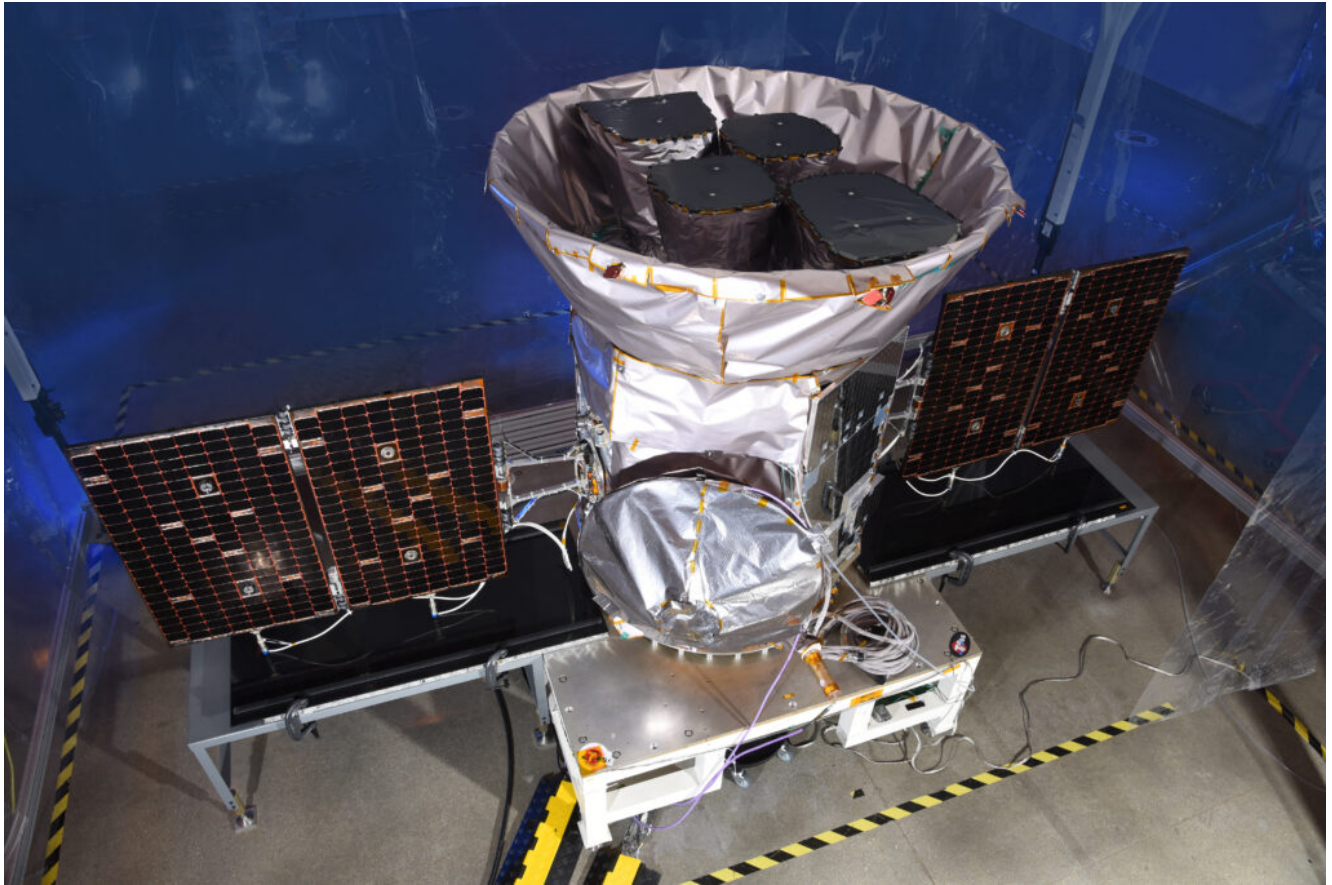


My own hand-drawn sketch of a potential simple school experiment representing the exoplanet transit method of detection. Made this up to present to supervisors after a workshop. *Own image, No Attribution Required*

From this graph: one can calculate the planet's radius before comparing it to our playdough planet physically with a ruler (observed vs. real radii). It's also possible to find the exoplanet's orbital period by finding the time difference between two brightness dip minima. We'll also make some assumptions about the planet's density – is it rocky like Earth or gaseous like Jupiter? With the volume from the radius already in hand then it's possible to calculate the planet's mass and think about gravitational forces.

But our extraterrestrial trip doesn't end there because my project needs to end with a prospect of legacy. I've discussed the idea of showing the students real exoplanet data from

satellites like the famous Kepler Space Telescope and TESS (MIT's Transiting Exoplanet Survey Satellite). There are real possibilities for any student via the avenue of Citizen Science and the purpose would be just to unequivocally show that anyone can "hunt aliens".



Transiting Exoplanet Survey Satellite (TESS) on November 2017, prior to it's 2018 launch. *Public domain image by [NASA/Orbit](#) [OTK](#) on [wikimedia](#)*

So All Good Then?

Not exactly. Honestly, my passion for this project also leaves an equal and opposite pressure to do well. Stressful, sleepless nights ahead.

I've got back into contact with my former physics teacher, Mr Cavers, to query him with questions about; the curriculum for National 5, Higher & Advanced Higher, the best time to execute such a project, and the marking scheme of the "project" aspect of Advanced Higher (which also shares a similar purpose of

university preparation). I've been reading through the Curriculum for Excellence (CfE) Benchmarks for S1-S3 to see what kinda base level of knowledge they'd be expected to have.

Cheers,

Charlie