



Mark



Liam



Laura



Kasia



Gina



Felix

November 2019

The Nuclear Zone was a themed zone, supported by the Science and Technology Facilities Council. There were six scientists taking part in the zone:

- Mark Johnson, the winner of this zone, works at CERN on the ALPHA experiment, trapping individual atoms made out of antimatter
- Liam Gaffney studies radioactive or unstable isotopes at CERN, to help us understand how protons and neutrons bind together
- Laura Sinclair is a medical physicist specialising in nuclear medicine and diagnostic radiology
- Kasia Clarke is a PhD student whose group uses Diamond Light Source in studying new materials for nuclear reactors to allow them to produce energy in a safer, more reliable way
- Gina Parker works for a nuclear engineering company as a structural analyst making computer simulations of the cores of nuclear reactors
- Felix Warren is an apprentice on a scheme run by the UK Atomic Energy Authority and STFC, with an interest in fusion energy and communications.

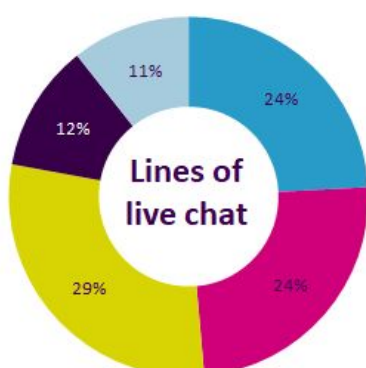
Key figures

This was the quietest of all the zones in November, with the least number of students logged in and questions asked.

The engineers all took an active role answering questions in ASK and joining live chats, except Gina who filled in a profile but, at short notice was unable to take part over the two weeks.

	NUCLEAR ZONE	NOV '19 ZONES AVERAGE	2012-19 ZONES AVERAGE
Schools	8	10	10
Students logged in	237	368	389
% of students active in ASK, CHAT, VOTE, or comments	92%	91%	87%
Questions asked	136	571	659
Questions approved	92	262	291
Answers given	206	457	525
Comments	13	45	69
Votes	176	294	307
Live chats	16	18	17
Lines of live chat	4108	6334	5771
Average lines per chat	257	352	356

Scientist activity



SCIENTIST

PLACE

Mark Johnson
Liam Gaffney
Laura Sinclair
Kasia Clarke
Felix Warren
Gina Parker

1st
2nd
3rd
4th
5th
6th

School activity



	YEAR GROUP(S)	CLASSES
A Reepham High School & College, Norwich (U)	7, 9, 12	3
B The Charles Dickens School, Broadstairs (WP/U)	9, 10, 11	3
C The Radcliffe School, Milton Keynes (WP)	8	3
D All Saints Catholic High School, Knowsley (WP)	11, 10, 9	3
E The North School, Ashford (U)	10	1
F Meden School, Mansfield (WP/U)	9	2
G Wyvern Academy, Darlington (WP/U)	9	1
H Mallaig High School, Highland (U)	10	1

We have found that schools that are more than 30 minutes travel time from their closest Higher Education Institution are less likely to receive visits and benefit from engagement activities. We give priority to underserved (U) and widening participation (WP) schools when allocating places. Find out more about our research at <https://about.imascientist.org.uk/2017/school-engagement-in-stem-enrichment-effect-of-school-location/>

Popular topics

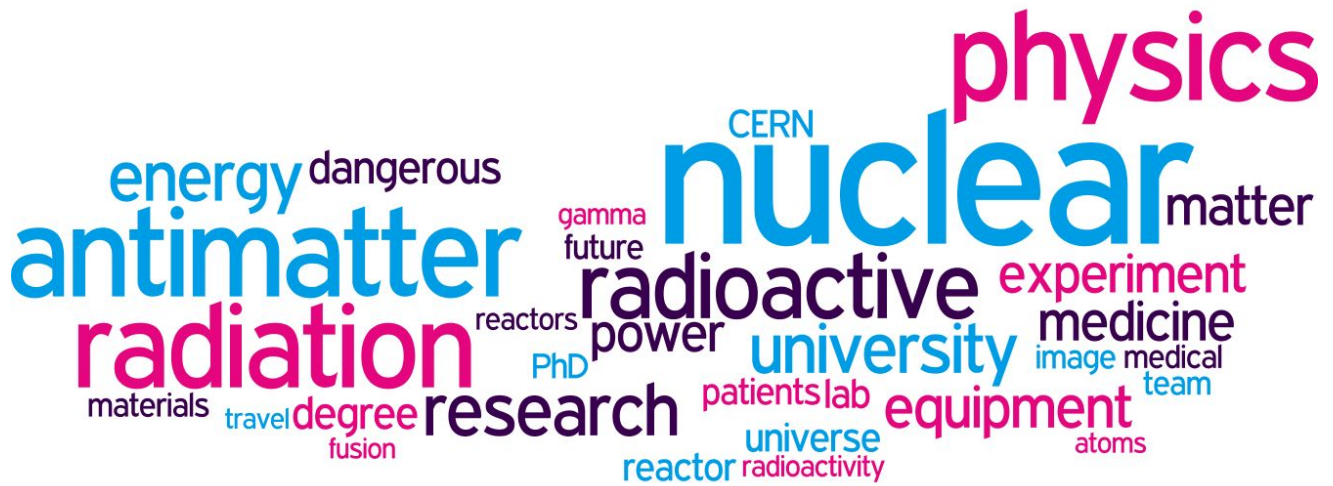
Discussions in the Nuclear Zone were very on topic, with students particularly interested in nuclear energy, the impact it has on climate change and how long we can use nuclear power for. The zone theme was clearly of interest to students, with the top words in the chat wordle related to nuclear, physics, matter and radiation.

Students sought a better understanding of matter, antimatter and nuclear reactions, and asked a lot about nuclear disasters and their impacts, such as Chernobyl, particularly to Sarah as she has visited the exclusion zone.

They asked Mark about his work with matter and antimatter, and Laura about her work and how she uses radiation within the hospital.

Off topic, students asked about personal interests and hobbies that they had read about on the scientists profiles, such as pets, travel and Felix's interest in Dungeons and Dragons.

Frequent words used in live chats by students and scientists



Question analysis



What is your gecko called?

What causes nuclear reactions?

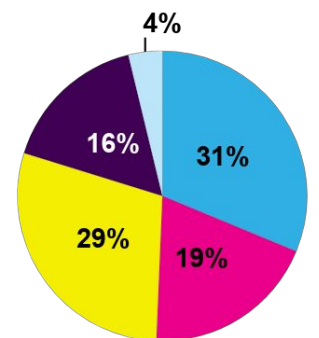
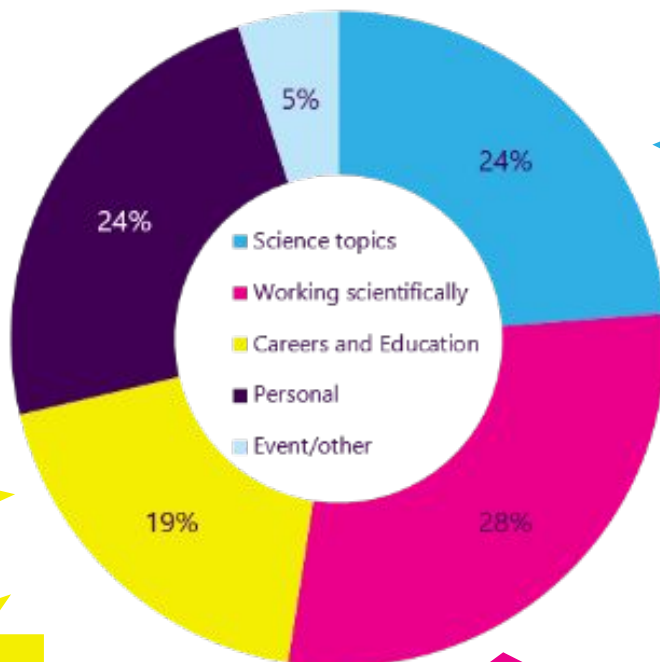
You have stated that you have attended Comic-Con in costume. Who/ what were you dressed as?

What type of radiation is used for x-rays?

Did anyone try to stop you following your career?

What is something you want to create using your knowledge?

How did scientists estimate how long areas around Chernobyl will be uninhabitable for?



Historic Per-Zone Average (Themed Zone)



Mark



Liam



Laura



Kasia



Gina



Felix

Examples of good engagement

All the scientists were great at explaining their research areas to students in accessible ways, using simple language students can understand:

*"How hard is it to make a nuclear reaction?" – **Student***

*"Nuclear reactions happen all of the time in stars, that's what makes them shine. But on earth, it's much harder to do it. You need to accelerate atoms so they're travelling well over a million miles per hour and keep them inside a vacuum so that the air doesn't slow them down. If you can do that and aim them at a target, there's then still only a **tiny** chance that you'll get a reaction as 99.9% of the atom is just empty space; the nucleus just passes straight through without reacting. To increase our chances of getting a reaction, we usually send millions or billions of atoms every second onto the target." – **Liam, Scientist***

*"I work at a facility that is attempting to make a fusion reactor. Our current reactor the Joint European Torus took around 5 years to make and we have constantly been adding bits and upgrading since it opened in 1984. It is currently estimated to be at least 10 more years before a full fusion power plant can be made." **Felix, Scientist***

Students were interested in how scientific theories work, wanting to know if things can be disproved and about the discoveries the scientists had made personally:

*"Do you think you can change theories that other scientists are discovered?" – **Student***

*"Definitely! Scientists are always trying to improve (or disprove) each other's theories - right now, thousands of scientists at CERN are looking for clues that might lead to a better model of the universe's smallest building blocks :)" – **Mark, Scientist***

*"What was your most important scientific finding?" – **Student***

*"A few years ago, I played a small part in a big discovery when my team measured the 'colour' of antimatter for the first time ever. Our result was in the New York Times and even on BBC news!" – **Mark, Scientist***

*"Wow that's cool!" – **Student***



Scientist winner: **Mark Johnson**

Mark's plans for the prize money: *"I would definitely use some of the money to put together hands-on experiments, like miniature particle traps that can be taken into schools. It's one thing to talk about doing cutting-edge science, but it's so much more exciting to actually do it for yourself! Unfortunately, it would be pretty difficult to have all of you visit our experiment in Switzerland, but I would also love to set up some 'virtual tours' of our lab that everyone can take part in!"*

Read Mark's [thank you message](#)

Student winner: **maze368zip**

As the student winner, maze368zip will receive a certificate and a gift voucher.

Feedback

We're still collecting feedback from teachers, students and scientists but here are a few of the comments made about November's *I'm a Scientist*...

Both classes absolutely loved taking part and my class actually clap at the end of the live chat...This project encourages a greater understanding and interest in science. Pupils see scientists as real people with interests like their own. It breaks down the stereotypes around the career. Taking part also encourages the pupils to think about the world of work and future careers.

— Teacher

We had our first live chat today and the students loved it!! It was so lovely to see them so engaged with the live chat and some of their questions were fab!

— Teacher

I particularly enjoyed the live chats with classes because the engagement was totally led by them and it was a lot of fun to chat about such a variety of things, from being a researcher, to their questions about dementia, to our favourite snacks, to Netflix - I'll miss doing them a lot! And, in chats, there were some questions that came up frequently, which has given me a better idea of some of the concerns/questions of younger people.

— Scientist

I'm a Scientist has changed my perspective on science

— Student