

**Name:** Dr Jim Al-Khalili      **Job:** Theoretical Nuclear Physicist

**Jim works** in a research lab studying the behaviour of atoms whose nuclei have been changed into unusual and exotic forms.

**The job involves** looking at what happens when the nuclei of light atoms are made heavier with additional neutrons. There's a lot of model building involved.

**Benefit of the work:** These studies try to answer 'the big question' – where does all living matter on Earth originate from? It looks like the answer is that we all originate from stellar dust. The work inspires us with a respect for life on our planet.

**Think you might be interested? Here are some of the skills you might need.**

### Personal skills or aptitudes:

- Curiosity and imagination
- To be inspired by nature
- Persistence
- Good observational skills

### Key skills:

- Problem solving
- Numeracy – you need to work with numbers when studying particle bombardment
- ICT – always helpful where statistical proof is needed from masses of raw data

## Skills Build

### First steps – moves you can take now

Start thinking about relative size and consider the miniscule, magic world of atoms. You can begin with microscope work on cells, considering their magnification, then think about the relative size and distance of stars and other solar systems. Join a science club and start a school debating society – debates can give you a chance to air scientific ideas and get feedback.

### Third floor

You'll need A levels in maths – pure and applied, or maths with statistics. Physics and chemistry are also invaluable subjects. You could add a subject that develops your use of English – perhaps English literature to AS level?

### On to the second level

The basics need to be in place so you will need GCSE double science, or single sciences, concentrating on physics. Maths and design technology (you'll need to understand the behaviour of materials), are also important.

### Fourth floor

You need to take a degree course in theoretical physics, particle physics – or perhaps nuclear physics. Research work follows once you've achieved this and you can be in a position to put forward your ideas for testing.

