

Physics – Prove Your Passion

Below are some ideas for you to consider that will help enhance your subject knowledge:

Join the Institute of Physics

Join the Institute of Physics – it is completely free for A-level students, although if you want to receive paper copies of the monthly ‘Physics World’ magazine then there is an annual fee. At the very least you can get a monthly update on the latest physics news, and also read in-depth articles about current cutting-edge physics topics. The direct link is <http://members.iop.org/16-19.asp>

Read books

It will help to stand back and see physics in its wider context, and also to look in more detail at some areas of physics that you may currently know very little about. I consider reading the three books in bold below to be the easiest way for you to do this, and they’re something that would be easy to obtain and simple for you to take away with you on holiday. The books are written at a level that assumes very little about your prior subject knowledge, but reading them will stretch you into areas that go beyond university level. The other books are also highly recommended.

- ***A Short History of Nearly Everything*** by Bill Bryson
- ***Big Bang: The Most Important Scientific Discovery of All Time and Why You Need to Know About It*** by Simon Singh
- ***What If?: Serious Scientific Answers to Absurd Hypothetical Questions*** by Randall Munroe
- ***A Brief History of Time*** by Stephen Hawking
- ***The Universe in a Nutshell*** by Stephen Hawking
- ***The Making of the Atomic Bomb*** by Richard Rhodes
- ***Carrying the Fire: An Astronaut’s Journeys*** by Michael Collins (the Apollo 11 astronaut).
- ***13 Things That Don’t Make Sense: The Most Intriguing Scientific Mysteries of Our Time*** by Michael Brooks
- ***Six Easy Pieces: Fundamentals of Physics Explained*** by Richard P Feynman (or any other book by the same author)

Watch online video

- Watch any or all of the “Schools Lecture series” videos made by the Institute of Physics. Don’t be put off by the title – they are all presented by experts in physics at the right kind of level, and the topics covered will really help you understand some of the details of the A level course. The link is: <http://www.iop.org/resources/videos/education/>
- You could spend your whole life watching physics video clips on youtube. No need, however, as the **minutephysics** and **veritasium** channels are all you’ll ever really need – and all clips are only a few minutes long. Subscribe. Watch them all. <http://www.youtube.com/user/minutephysics>

- Richard Feynman's "**Messenger Lectures**" on physics, archived with transcripts on Microsoft's Project Tuva website. <http://research.microsoft.com/apps/tools/tuva/>

Watch television programmes

Channels on Freeview to keep an eye on are BBC2, BBC4, Quest and Dave. Specific programmes to look out for, in order of personal preference, are:

- **Mythbusters** (on Quest, but also on cable and satellite channels) – Arguably the best show about scientific investigation, with added rockets! Watch it.
- **The Sky at Night** (BBC4) – longest running science TV programme in the universe, everything current in space and astronomy with proper experts.
- **Horizon** (BBC2 and BBC4) – topical science documentary, often physics-based. A bit woolly sometimes, but there have been interesting ones about neutrinos, time, black holes, etc.

Listen to audio

Mainly BBC Radio 4 broadcasts / iplayer / podcasts. Usually archived so they don't expire! These are in order, starting with the most relevant...

- **In Our Time** - Melvyn Bragg and guests discuss the history of ideas. My favourite, usually four professors having a sensible discussion, frequently on physics topics. Vast archive going back years, and more being added all the time. Examples of relevant episodes: The Age of the Universe, Radiation, The Vacuum of Space, The Measurement Problem in Physics, The Multiverse, Gravitational Waves, The Speed of Light..
- **The Life Scientific** - Professor Jim Al-Khalili talks to leading scientists about their life and work, finding out what inspires and motivates them and asking what their discoveries might do for mankind. Many episodes available on iplayer.
- **The Infinite Monkey Cage** – science/maths based comedy discussion series presented by Brian Cox and Robin Ince.

Visit places

Visit physics places. This is a selection from my own experience, plus recommendations from physicists that I know (from all over the UK, Europe and the world!). They are in order of distance from Bургate: ☑ **Great Dorset Steam Fair**, near Blandford Forum. Wednesday 29th August to Sunday 2nd September 2012. Other similar events exist, but this is the biggest and best. Tickets required.

- **The Bournemouth Balloon**, Bournemouth (BH1 2AQ). Rise up into the seaside air using 5575 m³ of helium gas. Buy a ticket. ☑ The planetarium at **Winchester Science Centre**, near Winchester (SO21 1HZ). Perhaps the best planetarium in the UK, and not too far away. Admission charge for planetarium shows.
- **The Clifton Suspension Bridge** and camera obscura, Bristol.
- A proper 'theme park' with thrill rides e.g. **Thorpe Park** (KT16 8PN) Not free! ☑ **STFC Rutherford Appleton Laboratory**, Oxfordshire (OX11 0QX). Huge science lab with site visits, open days at the Diamond Light Source, public lectures. Free, but book.

- **JET** at Culham, Oxfordshire. European project to develop nuclear fusion as an energy resource. Open evenings. Free, but book.
- **The Museum of the History of Science**, Oxford (OX1 3AZ) FREE ☞ **Bletchley Park**, near Milton Keynes. Historic site of secret British codebreaking activities during WWII and birthplace of the modern computer.
- **The Science Museum**, London (SW7 2DD) FREE
- **The Monument**, London (City of London) Not free, but get a combined ticket and see how Tower Bridge works too.
- **Cambridge Science Festival**. Runs 11-14 March 2013, featuring over 200 (mostly) free events.
- **Isaac Newton's birthplace**, near Grantham in the Midlands (NG33 5PD) FREE if you're a National Trust member. ☞ **National Space Centre**, Leicester (LE4 5NS)
- **Jodrell Bank Discovery Centre**, Cheshire (SK11 9DW). Visitor centre next to the historic radio telescope, covering all things to do with astronomy. Not free.
- **MOSI** (Museum of Science and Industry) (M3 4FP) in Manchester city. Free!
- **Edinburgh's Camera Obscura and World of Illusions**. Not free!
- **CERN**, near Geneva on the Swiss/French border. The public can visit their exhibitions (Microcosm and the Universe of Particles) and guided tours can be arranged. Free!
- **Smithsonian National Air and Space Museum**, Washington DC.

Follow physicists on twitter

- **Brian Cox** (@ProfBrianCox)
- **Jim Al-Khalili** (@jimalkhalili)
- **Andy Newsam** (@AstroAndyN) ☞ **Michio Kaku** (@michiokaku)