Dear proto-physicists,

We hope you are looking forward to taking the A level Physics course with us in the coming academic year.

At the end of this is a list of:

* Websites and resources that may be of use to you when you are studying physics
* A suggested reading list – the more you know, the more you will find to become interested in. The A level specification is a narrow slice of important though, by necessity, limited physics. Reading around topics will enable you to start linking together different ideas and start seeing the hidden connections between different phenomena. Reading books alone won’t guarantee success but there is a strong correlation between those who read a lot (and hence know a lot) and those that get top grades.

Having crammed your brain full of GCSE knowledge for the exams, it is likely that some of this may have leaked out over the last few weeks. So, to keep you up to speed, here are a couple of documents to work through. They will help bridge the gap between GCSE and A level by focusing on the GCSE Physics and Maths knowledge that will be most important to you at the start of the course. You will be expected to have worked through these; your understanding of the material here will be tested in class when we return to school.

<http://fdslive.oup.com/www.oup.com/oxed/secondary/science/Science_A_Level_Transition_Pack_Physics.pdf>

Maths is a vital part of A level Physics; it is language we use to describe the universe. If you want to check that your mathematical skills are up to scratch, here are some AQA activities to go through the important points. There are worksheets on the different topics along with presentations explaining the mathematical skills needed. If you are not taking A level Maths, then it is especially important that you ensure you can tackle these questions.

<https://www.aqa.org.uk/resources/science/as-and-a-level/teach/maths-skills-briefings>

Physics is wonderfully deep and complex subject. Success is purely down to the work you put in, but if you can apply yourself well, the universe is yours.

If you have any questions about any aspect of the course, please email me at the address below.

Regards

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**Physics Reading List**

These are all books that have been read and enjoyed by staff in physics department. They are listed alphabetically by author and not by complexity or topic. They all cover a wide range of topics with an equally wide range of depth – some are textbooks others are light popular science books. Some are far easier and/or shorter to read whilst others are more complex or abstract.

You can find a summary of any of these books with a simple search on the internet; look for something that interests you and start reading! Many of these authors have written other good books, too, so keep on reading and please recommend anything you have enjoyed to your teachers.

Where available, links to e-books are given.

**Books**

“Advanced Physics” by Steve Adams & Jonathan Allday

“The Jazz of Physics: The Secret Link Between Music and the Structure of the Universe” by Stephon Alexander

“Paradox” by Jim Al-Khalili

“The Infinite Book” by John D Barrow

“We Have No Idea” by Jorge Cham & Daniel Whiteson

“The Prism & The Pendulum – The Ten Most Beautiful Experiments In Science” by Robert P Crease

“The Great Equations” by Robert P Crease

“How To Take A Penalty” by Rob Eastaway (only in hardback on Amazon, so not sure an e-book exists)

“Relativity” by Albert Einstein - https://archive.org/details/einstein-relativity

“Surely You’re Joking, Mr Feynman!” by Richard Feynman

“QED” by Richard Feynman

“Six Easy Pieces” by Richard Feynman

“How to Dunk A Doughnut” by Len Fisher

“Why does E=mc2?” by Jeff Forshaw and Brian Cox

“Universal” by Jeff Forshaw and Brian Cox

“Chaos” by James Gleick

“The New Science of Strong Materials: Or Why You Don't Fall Through the Floor” by J E Gordon

“The Elegant Universe” by Brian Greene

“In Search of Schrodinger’s Cat” by John Gribbin

“Schrodinger’s Kittens” by John Gribbin

“Science: A History” by John Gribbin

“A Brief History of Time” by Stephen Hawking

“Amazing Stories of Quantum Mechanics” by James Kakalios

“The Physics Of Superheroes” by James Kakalios

“The Physics of the Impossible” by Michio Kaku

“Bang! The Complete History Of The Universe” by Chris Linto, Brian May & Patrick Moore

“It’s Not Rocket Science” by Ben Miller

“When the Uncertainty Principle Goes to 11: Or How to Explain Quantum Physics with Heavy Metal” by Philip Moriarty

“What If?” by Randall Munroe

“How To” by Randall Munroe

“The Death of Expertise” by Tom Nichols

“Breakfast With Einstein” by Chad Orzel

“How to Teach Relativity To Your Dog” by Chad Orzel

“How to Teach Quantum Mechanics To Your Dog” by Chad Orzel

“Seven Brief Lessons On Physics” by Carlo Rovelli

“Reality Is Not What It Seems” by Carlo Rovelli

“Bad Astronomy” by Philip Plait

“Cosmos” by Carl Sagan

“17 Equations That Changed The World” by Ian Stewart

“Counter-knowledge” by Damian Thompson

“Don’t Try This At Home – The Physics of Hollywood Movies” by Adam Weiner

“Aurora” by Melanie Windridge

“A History of the Universe in 100 Stars” by Florian Freistetter

“The End of Everything” by Katie Mack

**Useful Sites**

<https://physicsworld.com/> - the magazine from the Institute of Physics, lots of news and articles
<https://www.iop.org/> - more their homepage

<https://isaacphysics.org/> - online learning for physics
<https://brilliant.org/> - online learning for maths and physics

<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html> and
<https://www.cyberphysics.co.uk/> - both look a bit old but are a great summary of concepts
<https://phet.colorado.edu/en/simulations/category/physics> - one of the greatest physics sites ever. Play.
<https://interactives.ck12.org/simulations/physics.html> - more simulations to play with.

<https://www.physicsandmathstutor.com/> - good for practice
<https://www.kerboodle.com/users/login> - the electronic textbook will be here when you are enrolled on the course (funded by the school)
<https://www.aqa.org.uk/subjects/physics/a-level/physics-7408/specification> - The A level specification – one of the most important documents you will download

[https://www.amazon.co.uk/AQA-Physics-Level-Student-Book/dp/0198351879/ref=sr\_1\_4?dchild=1&qid=1591627572&refinements=p\_27%3AJim+Breithaupt&s=books&sr=1-4&text=Jim+Breithaupt](https://www.amazon.co.uk/AQA-Physics-Level-Student-Book/dp/0198351879/ref%3Dsr_1_4?dchild=1&qid=1591627572&refinements=p_27%3AJim+Breithaupt&s=books&sr=1-4&text=Jim+Breithaupt) – This is probably the most closely related textbook to our specification, though any A level physics textbook will suffice (you will need to check the specification in the previous link to ensure it is all covered). It is also available in two separate books – at an increased cost. Remember, an electronic version of this textbook will be available once you are enrolled on the course, so you don’t have to fork out £40 or so if you’re happy to read from a screen.