

## A-level Physics Reading/Listening beyond the Curriculum 2025

As you study Physics it is essential that you broaden your horizons as part of your *supercurricular study*. This means going above and beyond the material covered in class. A key part of this is reading. Having some to talk about in your UCAS statement is essential; even more so if you intend to apply to a highly competitive university. I would recommend that you try to read 1-2 of these per term of your study, at a minimum.

There are several YouTube channels covering physics, maths and engineering - use them regularly to broaden your horizons and develop your learning beyond A-level.

This list has been compiled by a number of physics educators over the years and is shared under Creative Commons Attribution-NonCommercial-ShareAlike (CC BY-NC-SA) 4.0 International licence. See end for details.

### Recommended Books

Title	Author
A Brief Welcome to the Universe – A Pocket Sized Tour <i>A nice introduction to the subject, which proceeds to explain multiverses and quantum tunnelling by the end of the book</i>	Neil De Grasse Tyson, Michael A Strauss and J Richard Gott
Black Holes and Time Warps <i>Fabulous account of space and time</i>	Kip S Thorne
Black Holes, Wormholes and Time Machines <i>A good introduction to the subjects in the title</i>	Jim Al-Khalili
Chaos <i>Accessible account of the basics of chaos theory. The opening chapter alone is a great insight into the personalities and lives some of the finest mathematicians and computer scientists of the 20<sup>th</sup> century. This is the book that got me into theoretical physics/applied maths.</i>	James Gleik
The Character of Physical Law <i>Brilliant (it's by Feynman)</i>	Richard Feynman
Clouds in a Glass of Beer <i>An excellent journey through atmospheric physics, with beer included.</i>	Craig F Bohren
Critical Mass <i>A totally fantastic book about the physics of society</i>	Philip Ball
Does God Play Dice? <i>Moderately technical but still easy to follow journey through applied mathematics/chaos theory. Makes the equations accessible - a must for keen mathematicians. Blew my mind as a teenager and I still recommend it today.</i>	Ian Stewart
Einstein in 90 minutes <i>Does what it says on the tin</i>	John and Mary Gribbon
Feynman's Lost Lecture <i>How he did gravitation without the equations</i>	David & Judith Goodstein
Five Biggest Ideas in Science <i>A brief introduction to the meaty stuff</i>	Charles Wynn & Arthur Wiggins
Five Equations that Changed the World <i>As above</i>	Michael Guillen
Halley in 90 minutes <i>Does what it says on the tin</i>	John and Mary Gribbon
How to <i>The sequel to "What if", another incredibly fun look at using serious physics to solve everyday problems in absurd ways. Shows the true power of physics, and the joy of playing with numbers and ideas.</i>	Randall Munroe
How to build your own spaceship <i>A fun and accessible introduction to modern spaceflight.</i>	Piers Bizony
How to drive a nuclear reactor <i>A superb, moderately technical book about nuclear reactor design and operation. Fantastically detailed but still accessible. For anyone interested in nuclear physics or engineering, this is a must read. Would look great on a UCAS statement!</i>	Colin Tucker

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In Search of Schrodinger's Cat <i>A fantastic introduction to quantum mechanics</i>	John Gribbon
Nature's Numbers <i>How maths is found in everything we look at</i>	Ian Stewart
Schrodinger's Kittens <i>A sequel to the cat (obviously), but rather complex at times</i>	John Gribbon
Six Easy Pieces <i>The great man sorts out the easy stuff...</i>	Richard Feynman
Six Not-So-Easy Pieces <i>...and the not so easy stuff</i>	Richard Feynman
Space: 10 things you should know <i>A short but excellent read on the basic ideas of modern astrophysics. A great bedtime read.</i>	Dr Becky Smethurst
Stardust <i>How you are made of the stuff inside stars</i>	John Gribbon
Storm in a Teacup – The Physics of Everyday Life <i>Helen is a brilliant science journalist and writer. This book links simple things like stirring a cup of tea with cool and interesting physics you probably won't have covered at school.</i>	Helen Czerski
Strange Beauty: Murray Gellmann and the Revolution in 20th Century Physics <i>Great biography of the man who said 'quark'</i>	George Johnston
Surely you must be joking, Mr. Feynman! <i>Feynman may have been the finest mind our species has ever produced. This is his life, in his own words. Fascinating, hilarious, and touching, it covers everything from the Manhattan Project to the birth of the standard model from the viewpoint of one of the men who made it all happen.</i>	Richard Feynman
The Case of the Missing Neutrinos <i>More stardust and the shrinking sun</i>	John Gribbon
The Glass Universe <i>A historical account of spectroscopy in early 21<sup>st</sup> Century astronomy, the discoveries built on it, and the unsung women who did most of the work. Contains lots of evidence from the time like diaries, letters, and the like.</i>	Dava Sobel
The New Science of Strong Materials <i>Or why you don't fall through the floor</i>	James Gordon
The Odd Quantum <i>An intro to quantum mechanics</i>	Sam Tremain
The Origin of the Universe <i>How it all began.</i>	John D. Barrow
The Science of Interstellar <i>Kip Thorne was science adviser on the film and published papers as a result of some of the research undertaken to make the CGI supermassive black hole. This book explains some of the cool science fact and possibilities in the film.</i>	Kip Thorne
Thing Explainer <i>Complex technology explained using only the thousand most common words in English. Hilarious, thought provoking, and beautifully illustrated.</i>	Randall Munroe
The Quantum Dot <i>How physics makes computers faster</i>	Richard Turton
Three Roads to Quantum Gravity <i>Excellent summary of how gravity and quantum mechanics might come together</i>	Lee Smolin
Uncle Tungsten <i>A wonderful account of the raw joy of scientific understanding</i>	Oliver Sacks
The Universe Next Door <i>The theory of multiple universes explained</i>	Marcus Chown
Unlocking the Universe <i>Have you ever wondered how the universe began? Or what it takes to put humans on the moon? What would you do if you could travel through space and time? Easy to understand series of essays by some eminent astrophysicists.</i>	Stephen and Lucy Hawking
Unsolved Mysteries in Science <i>What is red... and the missing link</i>	John Malone

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We have no idea <i>Fun summary of the things we don't understand – dark matter, dark energy, and so on. Not too technical - an easy read.</i>	Jorge Cham and Daniel Whiteson
What do you care what other people think? <i>... sequel to "Surely you must be joking....."</i>	Richard Feynman
What if.....? <i>Serious scientific answers to absurd hypothetical questions. This is joyously nerdy - a fantastically entertaining read. Highly recommended to show how physical laws can be applied anywhere with a little thought.</i>	Randall Monroe

### Recommended Podcasts

Title	Presenter	URL
Inside Science <i>Weekly BBC Radio 4 science show</i>	Adam Rutherford	<a href="https://www.bbc.co.uk/programmes/b036f7w2">https://www.bbc.co.uk/programmes/b036f7w2</a> or search Spotify for "BBC Inside Science"
More Or Less <i>Radio show/podcast about science, statistics, and evidence in the news and in life.</i>	Tim Harford	<a href="http://bbc.in/1KtUT0J">http://bbc.in/1KtUT0J</a> or search Spotify for "More or Less: Behind the Stats"
The Life Scientific <i>Biographies of and interviews with scientists</i>	Jim Al-Khalili	<a href="http://bbc.in/1ACXG7K">http://bbc.in/1ACXG7K</a> or search Spotify for "The Life Scientific"
The Supermassive Podcast <i>Current developments in astrophysics as well as history from the Royal Astronomical Society</i>	Dr Becky Smethurst & Izzie Clarke; plus guests.	Search Spotify for "Supermassive Podcast"
The Infinite Monkey Cage <i>Brian Cox, Robin Ince, and guests (a mix of comedians and world leading academics) discuss a topic in science. This is one of my favourite shows, which I've listened to every week for years. Utterly hilarious (and informative).</i>	Prof. Brian Cox, Robin Ince, guests.	<a href="https://www.bbc.co.uk/programmes/b00snr0w">https://www.bbc.co.uk/programmes/b00snr0w</a> or search Spotify for "The Infinite Monkey Cage"

### Recommended Youtube Channels

Title	Presenter	URL
Scott Manley <i>Space educator, astrophysicist, and gamer. Presents superb histories of spaceflight, concept deep-dives, orbital mechanics, and space news.</i>	Scott Manley	<a href="https://www.youtube.com/user/szyzyg">https://www.youtube.com/user/szyzyg</a>
Smarter Every Day <i>Superb physics and engineering content. Beautifully filmed.</i>	Destin Sandler	<a href="https://www.youtube.com/user/destinws2">https://www.youtube.com/user/destinws2</a>
Minute Physics <i>Does what it says on the tin. Great short summaries of physics concepts</i>	Henry Reich	<a href="https://www.youtube.com/user/minutephysics">https://www.youtube.com/user/minutephysics</a>
Dr Becky <i>Oxford University astrophysicist talks about important concepts in astronomy and explains cutting edge discoveries. Shows how a real astrophysicist lives and works.</i>	Dr Becky Smethurst	<a href="https://www.youtube.com/c/DrBecky">https://www.youtube.com/c/DrBecky</a>
Veritasium <i>Engaging and well-presented physics education videos, interviews and animations.</i>	Derek Muller	<a href="http://www.youtube.com/user/1veritasium">http://www.youtube.com/user/1veritasium</a>
Sixty Symbols/Deep Sky Videos	Various	<a href="https://www.youtube.com/user/sixtysymbols">https://www.youtube.com/user/sixtysymbols</a> <a href="https://www.youtube.com/user/DeepSkyVideos">https://www.youtube.com/user/DeepSkyVideos</a>

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Videos from the University of Nottingham Physics/Astronomy department on a massive range of topics. Essential for all physics students.		
Kurzgesagt Excellent, engaging animations about the big stuff – stars, black holes, and the end of the universe.	Animated	<a href="https://www.youtube.com/user/Kurzgesagt">https://www.youtube.com/user/Kurzgesagt</a>
Practical Engineering A professional civil engineer teaches engineering concepts. Essential for anyone interested in engineering.	Grady Hillhouse	<a href="https://www.youtube.com/user/gradyhillhouse">https://www.youtube.com/user/gradyhillhouse</a>
Real Engineering A large range of videos from the accessible to the technical across all fields in engineering.	Brian McManus	<a href="https://www.youtube.com/c/RealEngineering">https://www.youtube.com/c/RealEngineering</a>
3Blue1Brown The best YouTube maths educator. His series “Essence of calculus” and “Lockdown maths lectures” are mandatory watching for anyone thinking about a physics, engineering or maths degree.	Grant Sanderson	<a href="https://www.youtube.com/c/3blue1brown">https://www.youtube.com/c/3blue1brown</a>
The Efficient Engineer Excellent technical channel working through core concepts in engineering, showing full working through the maths with great visualisations. Particularly good to support your Y12 work on materials. Great introduction to fluids (important but not on the A-level) as well. Bridges the gap to undergraduate engineering– extend your learning!	Animated	<a href="https://www.youtube.com/c/TheEfficientEngineer">https://www.youtube.com/c/TheEfficientEngineer</a>
Steve Mould Physics concepts explained with custom built props. I learn something every time I watch his videos.	Steve Mould	<a href="https://www.youtube.com/@SteveMould">https://www.youtube.com/@SteveMould</a>
Physics Explained Outstanding long-form lectures on undergraduate topics, working through the mathematics in a very accessible way. This is a fantastic way to stretch and challenge yourself by working through how A-level work develops at university.	Animated	<a href="https://www.youtube.com/c/PhysicsExplainedVideos/">https://www.youtube.com/c/PhysicsExplainedVideos/</a>
Matt Parker Matt is the man I want to be when I grow up: part mathematician, part standup comedian. Joyously nerdy.	Dr Matt Parker	<a href="https://www.youtube.com/@standupmaths">https://www.youtube.com/@standupmaths</a>
The Royal Institution Hundreds of hours of talks by some of the finest minds on the planet. Get watching!	Various	<a href="https://www.youtube.com/@TheRoyalInstitution">https://www.youtube.com/@TheRoyalInstitution</a>
Gresham College Not a YouTube channel, but a portal to a vast resource of public lectures on every topic imaginable. Browse or filter by subject, and consume as much as you can!	Various	<a href="https://www.gresham.ac.uk/watch-now/browse-all?see-all">https://www.gresham.ac.uk/watch-now/browse-all?see-all</a>
The Feynman Lectures Richard Feynman was known to be an engaging and charismatic speaker. Although these videos may look a bit dated now, they contain some good physics!	Richard Feynman	<a href="https://www.youtube.com/playlist?list=PLyQSN7X0ro23NUN9RYBP5xdBYoiv2_5y2">https://www.youtube.com/playlist?list=PLyQSN7X0ro23NUN9RYBP5xdBYoiv2_5y2</a>
Cathy Loves Physics If you are interested in the history and people behind your A-Level physics, this really interesting channel is for you!		<a href="https://www.youtube.com/@Kathy_Loves_Physics">https://www.youtube.com/@Kathy_Loves_Physics</a>

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