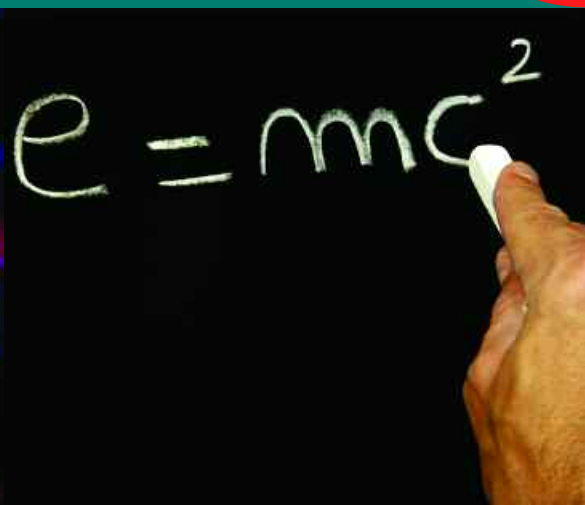


Internet resources for
physics



The best of the Web

Welcome to this guide to the best of the Web for Physics.

In these pages you will find a selection of some of the most useful websites for students, lecturers and researchers working in Physics.

The selection is by no means exhaustive, but it should give you a flavour of the range of resources available on the Internet for education and research.

Supporting your Internet research

For those interested in exploring the wider Web, we offer free Internet search and training services for further and higher education via *Intute* – details of these can be found at the end of the guide.

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Intute

This booklet is brought to you by *Intute*, a free Internet service providing you with access to the very best Web resources for education and research, selected and evaluated by a network of subject specialists.

www.intute.ac.uk

Expert advice

Intute services are developed in collaboration with staff from over seventy universities, colleges and research institutions across the UK – pooling expertise to share nationally.

Your guide for this booklet is:

intute: science, engineering and technology

– based at The University of Manchester and Heriot-Watt University.

Intute is funded by the Joint Information Systems Committee (JISC) with support from the ESRC and the Arts and Humanities Research Council (AHRC).

Contact:

www.intute.ac.uk/feedback.html

Note: Intute was formerly known as the Resource Discovery Network (RDN). Intute: Science, Engineering and Technology comprises the former RDN hubs, EEVL, GEsources and PSigate

Bibliographic databases

For the majority of bibliographic databases access is restricted to institutional subscribers.

Inspec

<http://www.iee.org/publish/inspec/>

Published by the IEEE, Inspec is the leading English-language bibliographic information service providing access to the world's scientific and technical literature in physics, electrical engineering, electronics, communications, control engineering, computers, computing, information technology, manufacturing, production and mechanical engineering. The database also contains extensive information relevant to physical chemists. *An institutional subscription is required for access.*

ISI Web of Knowledge

<http://wos.mimas.ac.uk/>

The Web of Knowledge service provides access to a number of databases in the sciences and other disciplines, including the Science Citation Index from 1981, ISI Proceedings Science and Technical edition from 1990, Current Contents Connect Physical, Chemical and Earth Sciences edition, Journal Citation Reports, ISI Chemistry, and Derwent Innovations Index. This platform provides a unique way of searching, including the ability to cross-search the content of multiple products and external resources simultaneously. *An institutional subscription is required for access.*

NASA Astrophysics Data System

<http://adswww.harvard.edu/>

This NASA-funded service provides access to over 5 million abstracts in three bibliographic databases: Astronomy and Astrophysics, Physics and ArXiv e-prints. These include all the major journals, many minor journals, conference proceedings, many Observatory reports and newsletters, many NASA reports, and PhD theses. The service also provides access to scanned images of articles from most of the major and many smaller astronomical journals, as well as many conference proceedings, and bulletins and Observatory publications. Users can also browse the latest tables of contents from a selection of major journals. Mirror sites are available.

SciFinder Scholar

<http://www.cas.org/SCIFINDER/SCHOLAR/>

This is a major database that provides extensive coverage of the literature for chemistry and a wide range of other scientific disciplines, and is maintained by the American Chemical Society. SciFinder Scholar is the world's largest collection of organic and inorganic substance information. The database provides more than 30 million substance records, over 10 million reactions, and over 23 million abstracts drawn from more than 9500 journals, patents, conferences and reports. Users can search by keywords, author names, chemical substances or reactions (using chemical name, chemical structure, molecular formula, or CAS Registry Number), and patents (using patent number). *An institutional subscription is required for access.*

Scopus

<http://www.scopus.com/scopus/home.url>

Scopus is a bibliographic database from Elsevier. It 'includes the abstracts and cited references of over 14,000 titles from more than 4,000 international publishers in the sciences and social sciences'. UK FE and HE institutions can subscribe via the JISC funded site licence initiative (UK students should check with their University/College library whether access is available). *An institutional subscription is required for access.*

Zetoc

<http://zetoc.mimas.ac.uk/>

Zetoc provides access to the British Library's Electronic Table of Contents of around 20,000 current journals and around 16,000 conference proceedings published per year. The database covers 1993 to date, and is updated on a daily basis. It includes an email alerting service, so that users can receive notification of relevant new data. zetoc is free to use for members of JISC-sponsored UK higher and further education institutions. The zetoc service is provided by MIMAS at The University of Manchester on behalf of the British Library and the JISC. *An institutional subscription is required for access.*



Data collections and databanks

These resources provide you with physical data, sometimes in a form that you can import.

Fundamental Physical Constants

<http://physics.nist.gov/cuu/Constants/>

This database gives values of the basic constants and conversion factors of physics and chemistry resulting from the 2002 adjustment of the fundamental physical constants as published by the CODATA (Committee on Data for Science and Technology) Task Group on Fundamental Constants and recommended for international use by CODATA. Site content also includes: the latest conversion factors for energy equivalents recommended by CODATA for international use; a searchable bibliography containing about 2000 published papers on the constants and related precision measurements; an introduction to the constants for non-experts; and links to selected scientific data. This site is a service of the NIST (National Institute of Standards and Technology) Physics Laboratory.

X-Ray Data Booklet

<http://xdb.lbl.gov/>

The X-Ray Data Booklet, second edition, was published in 2001 by the Center for X-Ray Optics and Advanced Light Source, Lawrence Berkeley National Laboratory. The content is available in full-text, and is organised into the following sections: X-ray properties of the elements; synchrotron radiation; scattering processes; optics and detectors; and miscellaneous. The Booklet is also provided in PDF format, requiring Adobe Acrobat Reader software.

Tables of Physical Data

<http://hyperphysics.phy-astr.gsu.edu/hbase/tables/ttab.html>

Part of the HyperPhysics site by Rod Nave, these data tables include data for mechanics, electricity and magnetism, heat and thermodynamics, optics, astronomy, acoustics, modern physics, condensed matter, nuclear physics, chemistry, geophysics, fundamental physical constants, and combinations of constants.

Atomic and Molecular Databases Around the World

<http://dpc.nifs.ac.jp/dblinks1.html>

This site, maintained by the National Institute for Fusion Science in Japan, provides lists of links to atomic and molecular databases. It covers: fundamental physical constants; spectroscopic data; collisional process data; nuclear physics data; and bibliographic databases. Links are also provided to the national data centres within the A+M/PMI Data Center Network.

The Review of Particle Physics

<http://pdg.lbl.gov/>

The Review includes a compilation and evaluation of measurements of the properties of the elementary particles. It is compiled by the Particle Data Group (PDG), an international collaboration of scientists charged with summarizing particle physics, as well as related areas of cosmology and astrophysics.

Journals

A selection of websites useful for finding out about physics journals.

American Institute of Physics: Journals

<http://journals.aip.org/>

The American Institute of Physics (AIP) publishes several physics research journals. Their website offers browsing and searching to access contents lists and abstracts, and subscription details and instructions for authors. Access to full-text is available to subscribers or by purchase of individual articles. (UK students should check with their University/College library whether access is available.)

American Physical Society: Journals

<http://publish.aps.org/>

The American Physical Society (APS) publishes several physics research journals. Their website offers browsing and searching to access contents lists and abstracts, which extend from the first volume of publication in 1893 to the most recent issue. Access to full-text is available to subscribers or by purchase of individual articles. (UK students should check with their University/College library whether access is available.) The website includes subscription details and instructions for authors.

Institute of Physics: Journals

<http://www.iop.org/EJ/>

The Institute of Physics (IOP) publishes several physics research journals. Their website offers browsing and searching to access contents lists and abstracts, which extend from the first volume of publication in 1874 to the most recent issue. Access to full-text is available to subscribers or by purchase of individual articles. (UK students should check with their University/College library whether access is available.) The website includes subscription details and instructions for authors.

Institute of Physics: Physics Reviews

http://www.iop.org/EJ/ejs_extra/-coll=rev

Physics Reviews is a service from the Institute of Physics (IOP), that brings together all review articles published in IOP's journals, including topical reviews and reviews from the Institute's dedicated review journal 'Reports on Progress in Physics'. Access to the review articles is subject to subscription status. (UK students should check with their University/College library whether access is available.) Non-subscribers of the source journals are given the option to buy the articles when they click on the full-text PDF links.

Institute of Physics: This Month's Papers

<http://www.iop.org/EJ/toc/-ff30=7>

As a service to authors and to the international physics community, all papers published in Institute of Physics (IOP) journals are made freely available in the IOP This Month's Papers facility for 30 days from the date of online publication. Only fair use of the content is permitted, which excludes regular/systematic downloading of the content, and excludes downloading a substantial proportion of the content. If these guidelines are not followed, then IOP may withdraw the service. Non-subscribers are required to create login to gain access to this facility. Those who do not have a username and password need to create an account first.

NASA Astrophysics Data System: Journal Query Page

http://adsabs.harvard.edu/journals_service.html

This NASA-funded service includes free access to scanned images of articles from most of the major and many smaller astronomical journals, as well as many conference proceedings, as well as observatory and society publications. Mirror sites are available.

ScienceDirect

<http://www.sciencedirect.com/>

ScienceDirect offers access to the Elsevier Science collection of over 2,000 journals, together with several bibliographic databases and full-text reference works. The collection contains over 8 million articles. Guest users may browse journal tables of contents, view abstracts and purchase copies of individual articles. Users from subscribing institutions have access to some or all full-text journal articles and other content, depending upon subscription options.

Directory of Open Access Journals (DOAJ)

<http://www.doaj.org/>

The aim of the DOAJ is to increase the visibility and ease of use of open access scientific and scholarly journals which meet certain quality criteria, thereby promoting their increased usage and impact. Browsing and searching options are available. A Frequently Asked Questions page is also offered.

E-prints

arXiv.org e-Print Archive

<http://www.arXiv.org/>

Started in August 1991, arXiv.org is an automated electronic archive and distribution server for research papers. Areas covered include physics and related disciplines e.g. astrophysics, condensed matter, general relativity and quantum cosmology, high energy physics, mathematical physics, nuclear physics, quantum physics, mathematics, computer science, nonlinear sciences and quantitative biology. Authors can submit their papers to the archive. Mirror sites are available.

E-Print Network

<http://www.osti.gov/eprints/>

The E-Print Network is a free service of the U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI). It provides a gateway to over 22,000 websites and databases worldwide, containing e-prints in basic and applied sciences, primarily in physics but also including subject areas such as chemistry, biology and life sciences, materials science, nuclear sciences and engineering, energy research, computer and information technologies. The service enables distributed full-text searching of e-print databases, and enables browsing of e-prints and related scientific websites by science disciplines.

Web directories

A selection of sites that provide an insight into the range and quality of freely available Web directories in physics.

PhysicsWeb

<http://physicsweb.org/>

PhysicsWeb is an online service provided by the Institute of Physics and provides frequent physics news, highlights of Physics World magazine, collections of key articles and websites in physics organised by topic (including: applied physics; astronomy and astrophysics; atomic, molecular and quantum physics; careers; condensed matter; history of physics; optics and lasers; particle and nuclear physics; physics in biology; superconductivity), PhysicsJobs, an events calendar, and a buyer's guide. Institute of Physics members can access Physics World magazine and other member services.

Intute: Science, Engineering and Technology: Physics

<http://www.intute.ac.uk/sciences/physics/>

This resource contains over 4,000 descriptions of freely available Web-based high quality physics resources, which can be searched or browsed by subject. The catalogue contains links to full text tutorials and lecture notes, to databases and databanks, journal websites, email lists, professional societies, reference material, etc. There is also a free science magazine Spotlight that discusses topical issues in science, and a physics timeline.

Martindale's Reference Desk: Virtual Physics Center

<http://www.martindalecenter.com/GradPhysics.html>

This resource comprises an extensive list of links to sites, compiled by Jim Martindale, covering all aspects of physics and some related science. It includes courses, textbooks, databases, dictionaries and glossaries.

PhysNet: the Physics Departments and Documents Network

<http://physnet.uni-oldenburg.de/PhysNet/>

PhysNet provides access to information from worldwide physics institutions and university departments. The site includes links to physics departments and institutions, document sources (such as preprints, research reports, annual reports and publication lists), free full-text journals, conferences, jobs, educational resources, and other physics websites. Mirror sites are available.

INIS (International Nuclear Information System): Internet Directory of Nuclear Resources

<http://www.iaea.org/inis/ws/>

The INIS Internet Directory, produced by the International Atomic Energy Agency, provides a database of annotated links to websites relevant to nuclear science and technology. The directory can be searched or browsed. Coverage includes: bibliographic databases, journals, reports, preprints, data, research institutions, nuclear installations, health and safety, other organisations, and nuclear gateways.

Net Advance of Physics

<http://web.mit.edu/redingtn/www/netadv/>

The Net Advance of Physics, compiled by Norman Hugh Redington of the Massachusetts Institute of Technology, provides physics review articles and tutorials in an encyclopedic format. Topics can be browsed alphabetically or hierarchically. An annotated list of links to related sites is also provided.

Professional societies, institutes and associations

A selection of the key contact groups for physics worldwide.

Institute of Physics

<http://www.iop.org/>

The Institute of Physics is an international professional body and learned society, established to promote the advancement and dissemination of knowledge and education in the science of physics, pure and applied. The IOP website includes information about the Institute, its activities, its publishing work (including links to IOP journals, magazines, and community websites), physics news, conferences and events organized by the Institute, physics Web links, and membership information.

American Institute of Physics

<http://www.aip.org/>

The American Institute of Physics (AIP) is a not-for-profit membership corporation chartered in New York State in 1931 for the purpose of promoting the advancement and diffusion of the knowledge of physics and its application to human welfare. The AIP website provides a wide range of resources including: physics news; links to member and affiliated societies; links to online journals of the AIP and its member societies; details of magazines, books, conference proceedings and other AIP publications; AIP publishing services; career services, including job listings; education and student services; science policy, including physics in government; The Center for History of Physics, including a newsletter, Web exhibits, the Niels Bohr Library, and the Emilio Segre Visual Archives; meetings and conference information.

American Physical Society

<http://www.aps.org/>

The American Physical Society, formed in 1899, is dedicated to the advancement and diffusion of the knowledge of physics. The site provides details of the activities of the society and a range of facilities. Some features (eg membership directory, full-text journals) are only accessible to members. Free facilities include: A Century of Physics Timeline; jobs; and links to physics Internet resources.

European Physical Society

<http://www.eps.org/>

The European Physical Society is a not for profit association whose purpose is to promote physics and physicists in Europe. Created in 1968, the EPS provides an international forum to discuss science and policy issues of interest to its members. This home page provides the magazine 'Europhysics News Online', information of activities, publication, conferences, membership, education, and EPS prizes.

Max Planck Institut fur Physik (Werner Heisenberg Institut)

<http://www.mppmu.mpg.de/english/>

The Max Planck Institut fur Physik is one of the almost 80 autonomous research institutes of the Max Planck Society. The institute's research is devoted mainly to studies of the fundamental constituents of matter, their interactions, and the role they play in astrophysics. The institute's Web page contains a list of research activities and groups, members of the institute, a list of publications and links to internal and external facilities. It also contains information about seminars and conferences at the Institute. The site is also available in German.

Mailing lists

Mailing lists can be useful for exchanging information and for general current awareness in a specific field or topic. Below is a selection of useful lists in physics.

PEERS : Physics Encyclopedia of E-Mail Records

<http://peers.iop.org/cgi-bin/PEERS/main>

PEERS is a free service from Institute of Physics Publishing providing a moderated global e-mail directory of people working in science. Users can search the directory and submit and update professional details.

Physsci-Education Mailing List

<http://www.jiscmail.ac.uk/lists/PHYSSCI-EDUCATION.html>

The Physsci-Education mailing list, hosted by JISCmail, is intended for teachers of the physical sciences in UK higher education. The subjects covered include: chemistry, physics and astronomy. The list is intended to be used for discussion of all topics relating to the teaching of the physical sciences.

Astro-Education Mailing List

<http://www.jiscmail.ac.uk/lists/ASTRO-EDUCATION.html>

The Astro-Education mailing list, a Higher Education Academy (HEA) Physical Sciences Centre list hosted by JISCmail, covers educational issues in astronomy for the UK higher education community.

Educational resources

There is a wide range of Web-based resources that support learning and teaching in physics.

Physical Sciences Resource Centre

<http://psrc.aapt.org/>

The Physical Sciences Resource Centre (PSRC) is a service provided by the American Association of Physics Teachers (AAPT) with support from the National Science Foundation and the American Physical Society Campaign for Physics. The PSRC is a web-based databank that provides links to a wide range of teaching and learning resources in the physical sciences. The site offers annotated links to: information on the latest techniques for teaching of physics, astronomy and physical science; information and reviews of curriculum materials; online demonstration resources; evaluation instruments; and communities of physics educators.

Intute: Science, Engineering and Technology: Physics

<http://www.intute.ac.uk/sciences/physics/>

This resource contains over 4,000 descriptions of freely available Web-based high quality physics resources. The catalogue contains links to full text tutorials and lecture notes, to databases and databanks, journal websites, email lists, professional societies, reference material, etc. There is also a free science magazine Spotlight that discusses topical issues in science, and a physics timeline.

Physlink : Physics and Astronomy Online

<http://www.physlink.com/>

Started in 1995, Physlink.com is a physics and astronomy online education, research and reference website. It is aimed at students and educators, physicists and engineers. The site also provides an online community, job vacancies, physics fun, ask an expert, and daily physics and space news.

Internet Physicist

<http://www.vts.intute.ac.uk/tutorial/physics>

'Internet Physicist' is a free, 'teach yourself' tutorial that helps the user practice their skills in finding physics information on the Web. It includes key Internet sites, help with searching, and guidance on how to determine whether an Internet site can be trusted. The tutorial is one of a set of tutorials within Intute's Virtual Training Suite (VTS), developed for UK HE and FE, funded by JISC.

How to Become a Good Theoretical Physicist

<http://www.phys.uu.nl/~thoof/theorist.html>

This site is a guide for the aspiring or amateur theoretical physicist, authored by Nobel Prize winner Gerard 't Hooft, the Institute for Theoretical Physics, University of Utrecht. The author gives his advice on becoming a physicist and brings together a list of Internet educational resources from various sources to produce a virtual course in physics outlined and linked on this page.

Contemporary Physics

<http://www.mhhe.com/physsci/physical/jones/>

This resource was created to accompany the textbook 'Contemporary College Physics, Third Edition, 2001 Update' by Dr Edwin Jones and Dr Richard Childers, published by McGraw-Hill. The site includes a glossary, chapter overviews, useful concepts, links to related websites, educational resources (puzzles, quizzes, etc), and practice problems. All the standard topics comprising contemporary physics are covered.

Duke Physics Challenges

<http://www.phy.duke.edu/~hsg/physics-challenges/challenges.html>

Duke Physics Challenges is a Web page created by Professor Henry Greenside, from the Physics Department of Duke University, in Durham, North Carolina, USA. This site offers a wide range of physics problems, or challenges, aimed at undergraduates. These challenges are applications of physics principles to everyday problems. Solutions, questions or simply discussion about the challenges can be made by sending an email to the author. Additionally, references, links and other collections of physics problems and challenges are provided.

Computer Animations of Physical Processes

<http://physics-animations.com/>

This site provides sample animations of several physics processes, classified in five main sections: waves, optics, mechanics, thermodynamics and electricity. The Waves section includes animations of longitudinal and transverse waves, interference, etc. The Optics section provides animations illustrating diffraction, reflection and polarisation, etc. Mechanics includes the gyroscope, vibration, scattering particles, etc. The thermodynamics section includes animations on Brownian motion, path length, Boltzman distribution, etc. The Electricity section includes channeling electrons and positrons in crystal, motion of electrons in a cathode ray tube, Millikan's oil drop experiment, etc. The site is provided by Siltec Ltd.

Physics news

Some resources providing up to date developments in physics.

Applied Physics : Best of PhysicsWeb

<http://physicsweb.org/bestof/appl-phys>

The Best of PhysicsWeb brings together articles from Physics World magazine, PhysicsWeb news stories and links to related websites. PhysicsWeb highlights the role of physics outside the laboratory in a wide range of diverse fields.

Physics News Update : The American Institute of Physics Bulletin of Physics News

<http://www.aip.org/pnu/>

'Physics News Update', created by the American Institute of Physics (AIP), is a digest of physics news items arising from physics meetings, physics journals, newspapers and magazines, and other news sources. Physics News Update appears approximately once a week.

PhysOrg.com : Science, Physics, Technology, Nanotechnology, Space News

<http://www.physorg.com/>

Physorg.com is a website that provides the latest physics and technology news from around the world taken from verified news sites. The news is grouped into six main categories: electronic devices, general science, nanotechnology, physics, space and earth sciences, and technology and reports are labelled with the time since the story was first published.

Spotlight

<http://www.intute.ac.uk/sciences/spotlight/>

The Spotlight science magazine contains topical articles and news features prepared for Intute by the science writer David Bradley. Subjects range from climate change to outer space, and from nanoscience to earthquakes and volcanoes.

Newsround

<http://www.intute.ac.uk/sciences/newsround.html>

Newsround is a news aggregation service provided by Intute. The service gathers together a wide range of subject-based newsfeeds from across the Internet and presents them in a single searchable interface. The user can search across any or all of the available newsfeeds.

Discover the best of the Web using Intute

The Internet can be a powerful tool for learning, teaching and research, offering a huge range of information and services. However, finding relevant resources online can be a daunting task, and issues of trust, quality and poor search skills are very real and significant concerns – particularly in education and research contexts.

Intute exists to help students, teachers, researchers and librarians make sense of the Web by providing access to the very best Internet resources for education and research, selected and evaluated by a network of subject specialists.

intute : science, engineering and technology

- The **Intute** database provides access to thousands of high-quality Internet resources, selected and described by subject specialists, and covers all key areas of the physical sciences, mathematics, computing, engineering and geography.
- The **Virtual Training Suite** offers free Internet training with a set of “teach-yourself” online tutorials, designed to help students develop their Internet research skills.
- Free **support materials** for universities and colleges, such as flyers, posters, leaflets and presentations as well as a range of “best of the Web” subject booklets.
- **Recommended subject services** - such as **The World Guide** comprising guides to over 270 countries, interactive maps, thousands of satellite images, etc.; **Ejournal Search Engine (ESEE)** with access to over 250 freely available full-text ejournals relevant to engineering, mathematics and computing; the **Spotlight Magazine** providing a growing database of unique articles on current topics in science; and thematic **Timelines** containing dozens of key events which have shaped the world as we know it, together with suggested Intute searches for further research.



Getting involved with Intute

- Sign up for a personal **MyIntute** account, which provides weekly email updates of recently added websites and allows you to save resources of interest.
- **Working with Intute.** Join our community of users of online resources by suggesting sites for the database or embedding *Intute* services in your own websites and Virtual Learning Environments using our sophisticated **MyIntute Include** services.
<http://www.intute.ac.uk/myintute/>

