

# **ROYAL ASTRONOMICAL SOCIETY**

## **Library Information Sheet**

### **Sources of Biographical and Portrait Information on Astronomers**

This document is intended to serve as a general guide to researchers, and particularly as an aid to those using the RAS Library. Those requiring portraits for publication should refer to the Library Information Sheet 'Notes for Picture Researchers'.

The chances of a successful search are improved if as much information as possible is assembled in advance; for example, the full name (correctly spelt!), nationality, approximate dates of birth and death, places of work, specialisms, society memberships, and so on.

A full bibliography of the sources referred to in the following text is appended at the end of this document. The sources are arranged roughly in order of the prospect of finding useful information combined with accessibility.

Westminster Reference Library, 35 St. Martin's Street, London WC2H 7HP (off Leicester Square) holds many of the major reference books referred to, including some not held in the RAS.

#### ***List of Abbreviations:***

A2A	Access to Archives
ARIBIB	Astronomisches Rechen-Institut Heidelberg Bibliographical Database for Astronomical References
BAA	British Astronomical Association
CURL	Consortium of University Research Libraries
DNB	Dictionary of National Biography
IAU	International Astronomical Union
IAU WGPSN	International Astronomical Union, Working Group for Planetary System Nomenclature
NASA ADS	NASA Astrophysics Data System
RAS	Royal Astronomical Society
RCHMss	Royal Commission on Historical Manuscripts

### **Biographical Material**

#### **1. If subject is alive, or died within the last 50 years**

Try *Who's Who*. For recent British and European scientists try *Who's Who in Science in Europe* and, for North American ones, *American Men and Women of Science*. Some US astronomers omitted from the latter are included in the *American National Biography* (successor to *The Dictionary of American Biography*).

Many Australian figures feature in R. Bhathal's *Australian Astronomers* and in R. Haynes et al's *Explorers of the Southern Sky*, and Canadians in R. A. Jarrell's *Cold Light of Dawn*. For Russians, or citizens of countries in the former USSR, try J. Turkevich's *Soviet Men of Science* and for Lithuanians, S. Matulaityte's *Astronomers: Bibliographical Index*. Also try Abbott's *Biographical Dictionary* and Debus's *World Who's Who in Science*.

Information on living astronomers, or those who have very recently died, can be the most difficult of all to obtain, as obituaries have not yet been published. Obvious current biographical sources

such as *Who's Who*, publications such as *Who's Who in America*, and the *Year Book of the Royal Society* can be tried. Books by the subject may have biographical information on their covers. There are lists of IAU members in the International Astronomical Union's publications, the journal *Transactions of the International Astronomical Union*, and the IAU's website, <http://www.iau.org/>. Information on living astronomers can also be gleaned by using the NASA ADS website to find their recent papers, and perhaps affiliation.

The RAS does not give out addresses of living Fellows, but any Fellow can be written to c/o the Society. *Astronomy and Geophysics*, and its predecessor, the *Quarterly Journal*, report citations made on presentation of RAS awards, which may include biographical details, and *The Observatory* reports on meetings to commemorate distinguished Fellows. Awards with a wider appeal, such as appointments of Astronomers Royal, are often reported in journals such as *Nature* and *Astronomy Now*.

## **2. If subject is deceased**

Consult the *Dictionary of Scientific Biography*. This work includes short biographies of many past scientists and excellent bibliographies which can be used to find the significant literature on the subject up to the date of publication. The following mentioned above, also contain information on scientists of earlier years: *American Men and Women of Science*; *American National Biography*; Abbott's *Biographical Dictionary*; Debus's *World Who's Who in Science*.

## **3. General Biography in the RAS Library**

To find biographical books and pamphlets in the RAS library, look in the subject catalogue under QB 36, where such material is listed in alphabetical order of subject. Biographies of scientists in fields other than astronomy have also been put there for convenience in a single sequence. It might also be worth browsing through QB 35, which lists collected biographical works.

## **4. RAS Members**

Did the subject live beyond 1820? Then if they were a member of the RAS (normally a Fellow, but possibly an Associate), they may have been recorded by an obituary on their death.

A valuable [index to obituaries](#) and similar articles in the Society's journals has been compiled by A. J. Kinder and is available on the RAS web pages, <http://www.ras.org.uk/html/obits/obits.html>, or in printed form in the Library. Note that obituaries are variously listed under *Biographical Notices* and *Obituary Notices*; from 1960 to 1996 obituaries appeared in the *Quarterly Journal*, and from 1997 in *Astronomy and Geophysics*.

For the majority of RAS Fellows (the exception being a few of the early ones) it should be possible to find and copy the form or proposal for election, giving the address, titles, and sponsors. (Note that this information will normally only be given for Fellows who have been dead for at least 40 years.) As a double check (omissions having occasionally been found in the card index), for suspected early Fellows it may be worth consulting the lists variously inserted in early volumes of *Monthly Notices* and *Memoirs*.

If an obituary exists, it normally indicates that the member was held in a certain esteem by the Society, though, as in most journals, the number of published obituaries has declined over the years (see Lankford's article *A Crisis in Documentation* for a description of this process). Obituaries generally give a good amount of personal and professional information (though the light of history may, of course, shine on the subject in a different way from a contemporary assessment written by friends and colleagues), and may also give clues to other sources – society memberships and so on.

The RAS Author catalogue should be checked for books and pamphlets by the subject, and the Archive catalogue for manuscript papers or correspondence. A supplement to the published Archive catalogue is in preparation, and can be consulted in the Library. A list of books and pamphlets in the RAS Library which have been catalogued since 1995 are available as a Microsoft Word file on the Society's website, and this file, together with a scanned Word version of the RAS archive catalogue, is also available for consulting in the Library,. Detailed information and anecdotal accounts on many figures in the RAS's history can be found in the *History of the Royal Astronomical Society* volumes by Dreyer & Turner and Tayler.

Another journal, associated with the Society but not published by it, is *The Observatory*. In its earlier years this included many biographical snippets, and there are cumulative indexes up to vol. 90 (1970). It includes a few portraits and group photographs.

## 5. Obituaries in other sources

If it is likely that the person was a Fellow of the Royal Society, the RS has produced an invaluable handlist of all its Fellows from 1660 to 2000, and an index to their obituaries (which were only published from 1830) to 2000. Copies of both are held in the RAS Library, and they are also available on the Royal Society's website, <http://www.royalsoc.ac.uk/>. Obituaries appeared in the *Proceedings of the Royal Society* (1800-1932), the *Obituary Notices of Fellows of the Royal Society* (1932-1955, not held in the RAS Library), and the *Biographical Memoirs of Fellows of the Royal Society* (1955 to date). The Royal Society also maintains the *Sackler Archive Resource*, a database offering access to biographical information on Fellows of the Royal Society, (principally those elected 1660-1950), which can be accessed through its website.

Obituaries are also to be found in a number of other journals specialised by subject or nationality:

*Journal of the British Astronomical Association* is applicable to subjects who died after 1890 and particularly to amateur astronomers. There is a published index to Vols 1-50 (1890-1940), and R.A. Marriott has recently published a second volume covering Vols 51-100 (1940-1990). A.J. Kinder, Hon. Librarian of the British Astronomical Association, has compiled a list of all BAA members from 1890; he may be able to answer postal enquiries on particular names. (Mr A.J. Kinder, c/o B.A.A., Burlington House, Piccadilly, London W1J 0DU).

*Astrophysical Journal* formerly included obituaries of internationally famous figures and those associated with the journal.

*L'Astronomie* has many obituaries since 1888, mainly of French astronomers but some US/international ones also (in French). Annual indices only.

*Journal of the Association of Lunar & Planetary Observers* has some short notices; some years indexed, but not all.

*Publications of the Astronomical Society of the Pacific* regularly included obituaries up to Volume 82 (1970; less regularly thereafter), with an emphasis on West Coast Americans, but also many British and European figures. Indexes exist for each 25 volumes then 76-82.

The above journals are indexed on the *ARIBIB* online index, and some are also abstracted on the NASA ADS website.

## 6. Miscellaneous biographical sources.

The Royal Commission on Historical Manuscripts' *The Manuscript Papers of British Scientists*, is a useful source. The Commission's successor, the Historical Manuscripts Commission has compiled a *UK National Register of Archives*, <http://www.hmc.gov.uk/nra/nra2.htm>, which includes references to papers of persons and families relating to British history, plus connected records, in a network of locations in the UK and abroad.

There are many biographical references in *Sky and Telescope* magazine (naturally strong on American astronomers). There is an unpublished biographical index, last revised 2000, by Kevin Krisciunas, a copy of which is kept with the run of the journal in the RAS Library. A detailed subject index has also been published. The Krisciunas index can also be accessed on Dr Krisciunas's website at <http://www.ctio.noao.edu/~kevin/st.html>.

De Vorkin's bibliography *The History of Modern Astronomy* contains many references to biographical articles, including those where the influence of a subject's work is discussed in context. Also try Abbot's *Biographical Dictionary*, Debus's *World Who's Who in Science*, and Poggendorff's *Biographisch-Literarisches Handwörterbuch* (1863 to date).

For references to contemporary articles, obituaries and portraits in journals such as *Nature*, and *Philosophical Magazine* up to about 1930 see Scott Barr *Index to Biographical Fragments in Unspecialized Scientific Journals*.

For British figures of any period up to 1960 try the *Dictionary of National Biography*. The *Concise Dictionary* down to 1950 is on the RAS Library's open shelves and contains short references to anyone who is in the full version, which also has supplements to 1960 and is available in the Library in the Compact Edition, in microprint form (i.e. readable with a magnifying glass). A complete revision of the *DNB* is in progress, and is due to appear in about 2005; meanwhile, some of the more glaring omissions have been included in a stopgap *Missing Persons* volume. A less well-known supplement to this is Boase's *Modern English Biography*, which may be available in libraries.

Taylor's books on *Mathematical Practitioners* contain much information on instrument makers and others associated with astronomy but must be used with caution in the light of later research. These books have been supplanted for instrument makers, though not for other figures such as publishers, by Clifton's *Directory of British Scientific Instrument Makers* (see Crawforth's article in the *Bulletin of the Scientific Instrument Society* for a guide to the use of this and other printed and manuscript sources on instrument makers). The Germanic equivalent of this book is Zinner's work on German and Dutch instrument makers.

Two books of collected short essays contain a number of biographical notes and portraits including some obscure figures; Patrick Moore's *Armchair Astronomy* and Ashbrook's *Astronomical Scrapbook*.

Two less well-known sources of considerable use for minor British figures (especially clergymen) are Venn's *Alumni Cantabrigienses*, Foster's *Alumni Oxonienses* and Emden's *Biographical Registers of the Universities of Oxford and Cambridge*. Together these provide details on all Oxford and Cambridge graduates up to 1886 and 1900 respectively. Records of French scientists may well be sought in the Academie des Sciences *Index Biographique*. Astronomers associated with survey work in India up to 1843 may be found in the numerous biographical notes in Phillipore's four-volume work on the Survey of India, amplified by Markham's later book.

## 7. Bibliographical materials used as biographical sources

Bibliographical sources may be consulted to find books and articles by the subject and some may also reveal obituaries if the volumes near a known date of death are scrutinized. These include:

Up to 1925: Royal Society *Catalogue of Scientific Papers*.

Up to 1880: Houzeau and Lancaster *Bibliographie Generale de l'Astronomie* - consult the *biographie/necrologie* sections of vols. I & II and the name index to vol. I in the 1964 edition. Covers material up to 1880. Included in *ARIBIB* index.

1881-1898: Stroobant, P. and Belgian National Committee for Astronomy. *Bibliography of Astronomy 1881-1898*.

1899-1968: *Astronomischer Jahresbericht*. Biographical articles indexed under author not subject, necessary to look in biographical section. Included in *ARIBIB* index.

1969-2000: *Astronomy and Astrophysics Abstracts*. Similarly look in sections 005/006/007 (*Biography, Personal Notes, Obituaries*); again, subjects' names are not indexed. Included in *ARIBIB* index.

A series of bibliographies dealing specifically with the history of science (not held by the RAS):

*ISIS Cumulative Bibliography: a bibliography of the history of science formed from ISIS critical bibliographies*. Four series to date, covering *ISIS critical bibliographies* from 1913-1995.

Bibliographical Websites:

*ARIBIB* (*Astronomisches Rechen-Institut Heidelberg Bibliographical Database for Astronomical References*), <http://www.ari.uni-heidelberg.de/arib/>. The most comprehensive free Web index to bibliographies of older astronomical material; includes articles indexed by Houzeau and Lancaster *Bibliographie Generale de l'Astronomie*, *Astronomischer Jahresbericht* and *Astronomy and Astrophysics Abstracts*. Does not (currently) include material published after 2000.

*COPAC*, <http://www.copac.ac.uk/copac/>. A union catalogue providing free access to the merged online catalogues of the largest university research libraries in the UK and Ireland, using records supplied by the Consortium of University Research Libraries (CURL). Can produce items not included on other bibliographical websites, eg. catalogues of items bequeathed by a particular person.

*NASA ADS (NASA Astrophysics Data System)*, <http://adswww.harvard.edu/>. Includes free index to astronomical and geophysical article abstracts; coverage of older material less comprehensive than *ARIBIB*.

## **8. If the date of death is roughly known and the figure is of reasonable eminence**

It may be worth consulting the index to the *Times* for any valedictory notes. Westminster Reference Library holds the printed index to the *Times*, and microfilms of the paper. Most large libraries have the *Encyclopaedia Britannica* 11th ed., 1911, the best edition for pre-1910 history and biography, British and foreign.

## **9. Lunar and Other Celestial Object Nomenclature**

Requests are often received at the RAS as to the identity of people whose names are attached to lunar features, or for the location of a named feature. The following items will give a start. Menzel's *Report on Lunar Nomenclature* is an authoritative reference. Recent works to illuminate this complex field include Cocks' & Cocks' *Who's Who on the Moon*, and Ewen Whitaker's book, *Mapping and Naming the Moon*. Earlier sources include the BAA's *Who's Who in the Moon* (a complete revision of which is currently in progress) and Wilkins & Moore's *The Moon*. Andersson & Whitaker's *NASA Catalogue of Lunar Nomenclature* gives a detailed list of names and positions, while Rukl's *Maps of Lunar Hemispheres* provides key maps. The IAU WGPSN authorises the naming of important features on the surface of planets and satellites, and their database, *Gazetteer of Planetary Nomenclature*, is maintained by the United States Geological Survey on their website, <http://planetarynames.wr.usgs.gov/>. Regrettably, there is still no source of reference covering former names of features which have been superseded.

There are many astronomers, and others, whose achievements are recorded in the naming of a Minor Planet. Potted biographies are to be found in Schmadel's *Dictionary of Minor Planet Names*.

There are a few objects which have non-systematic 'customary' names, such as the Gum Nebula, or Barnard's Star, and the best place to start to research these is in the various Dictionaries of Astronomy, such as Ian Ridpath's *Dictionary of Astronomy*, or Jacqueline Mitton's *Cambridge Dictionary of Astronomy*.

## **10. Archival Material**

There is not space here to list all the possible sources of manuscript material, and a research project of this kind is in any case a different matter from looking up printed references. The archives of the Royal Greenwich Observatory, the RAS, and the Royal Observatory Edinburgh contain much material of use to the would-be biographer, but enquirers must expect to do a good deal of spade work themselves. A Microsoft Word version of the RAS archive catalogue is available in the RAS Library.

A useful but not exhaustive guide to locations is provided by the RCHMss list of papers of British scientists; the latter holdings are included on the Historical Manuscripts Commission's *UK National Register of Archives* website. Other websites which may be of use are *Archives Hub* and *Access to Archives (A2A)*.

## **10. Websites**

### **10.a Biographical Websites**

*MacTutor History of Mathematics Archive*, University of St Andrews, <http://www-history.mcs.st-and.ac.uk/history>. Collection of over 1000 biographies and historical articles of a mathematical nature; features include birthplace maps, and facility to check mathematicians who were born or died on a given date. Portraits of many individuals are available, and can be downloaded as posters.

*Astronomiae Historia / History of Astronomy*, <http://www.astro.uni-bonn.de/~pbrosche/astoria.html>. Originally created for the Astronomische Gesellschaft; since 1998 it has also been maintained on behalf of Commission 41 (History of Astronomy) of the International Astronomical Union.

Provides information for historians of astronomy and related fields. Includes short biographies and very comprehensive selection of biographical website links, organised into categories.

*Astro Info Service*, <http://www.astroinfoservice.co.uk>. Formed in 1982 by Dave Shayler, co-founder and chairman of the Midlands Spaceflight Society, to distribute information on human space exploration, including that from the former USSR, using official documentation from major space agencies. Their services include biographical profiles of astronauts and cosmonauts, with portraits, which will eventually be available by mail order; some of these can be downloaded from their website.

### **10b Archive Websites:**

Historical Manuscripts Commission (formerly Royal Commission on Historical Manuscripts), UK National Register of Archives, <http://www.hmc.gov.uk/nra/nra2.htm>. Includes references to papers of persons and families relating to British history, plus connected records, in a network of national and local record offices, university libraries and specialist repositories in the UK and abroad.

*Archives Hub*, <http://www.archiveshub.ac.uk>, maintained on behalf of the Consortium of University Research Libraries (CURL), provides a single point of access to descriptions of archives held in UK universities and colleges, and forms one part of the UK's National Archives Network.

*Access to Archives (A2A)*, <http://www.a2a.pro.gov.uk>, maintained at the Public Record Office, contains catalogues of archives (largely local record offices) from all over England. Includes section of web links for family historians.

## **Portraits**

Though many portraits have been published, many more remain unreproduced, and some searches may need recourse to original material. Some sources listed under "Biographical material" will also include portraits. For historical figures, the nature of material available will depend on when the subject lived.

Where portraits are required for reproduction the need to obtain permission to reproduce copyright images should be borne in mind.

It should also be borne in mind that there are some quite notable astronomical figures for whom no portrait has been traced, and it is quite likely that none ever will be. Examples include the notable solar astronomer, R.C.Carrington, J. Birmingham, and Robert Hooke. It is rarely possible to identify the subjects of portraits with few or no clues to help.

The obvious source for portraits of living or recently-deceased astronomers is the department or other institution to which they are, or were, affiliated.

### **1. Published Sources**

There are many books and journal articles illustrated by portraits, and suitable biographical sources listed above should be consulted, particularly *Sky and Telescope*. Some books including numerous

portrait illustrations are those by Berendzen, Hart and Seeley (which includes many modern astrophysicists); Learner; and the Astronomischen Gesellschaft (1904, 1931) (many small medallion portraits of then active astrophysicists; worldwide but inevitably strong on European figures).

Patrick Moore's *The Astronomy Encyclopaedia* includes a number of portraits. Portrait photographs of BAA Presidents are often published in the *Journal of the British Astronomical Association* about the time of their presidency, as well as some other notable figures. In the case of astronomers noted for work in specific fields it is well worth looking in books on that field, other than overtly historical ones, as they will often include an historical summary (for example, Cunningham's book on Asteroids). Quite a few International Astronomical Union Symposia include such summaries.

For British sitters there is a 4-volume reference work, Ormond and Rogers' *Dictionary of British Portraiture*, giving locations of many images. To this may be added Yung's catalogue of National Portrait Gallery holdings (1981), Franklin's 1995 supplement to this, and the older work by O'Donoghue on the British Museum's holdings of portrait engravings.

The Society has a collection of portraits, predominantly photographs but including some engravings and paintings; most date from between 1850 and 1940, but there is some older and newer material. A portrait is held of every President the Society has had. A card index exists of most of the collection, which is being progressively included in the supplement to the Archives catalogue. A Microsoft Word version of Bennett's catalogue of the RAS archives is available in the Library, together with a large draft addendum in which archives or portraits of individuals may be sought. Original photographic portraits in the hands of the British Astronomical Association are included in the RAS card index, and may be viewed by permission of the Officers of the Association.

For scientists of sufficient eminence to be commemorated in Westminster Abbey, Hall's *The Abbey Scientists* will indicate memorials, busts etc. Some published lists will be a guide to sitters distinguished by nationality or Society; for Fellows of the Royal Society there are Robinson's 1980 catalogue, Hammill's 1976 catalogue, and the older Royal Society catalogue of portraits of 1912. Scots may well feature in Guthrie's *List of Portraits in the Royal Society of Edinburgh*, while for Oxford figures there is Lane Poole's *Catalogue of Portraits*, 1912. For Canadian figures there seems to be no systematic published list, but it may be worth writing to the Librarian of the Royal Astronomical Society of Canada, 136 Dupont Street, Toronto, Ontario M5R 1V2, Canada, or to the National Library in Ottawa.

## 2. Private sources

There are various sources of portrait material which for one reason or another are not freely available to the public. Portraits of historical figures may be found in the Mary Evans Picture Library, a commercial picture agency which charges for access and for supply of material. Similar sources potentially useful for more recent astronomers, astronauts, and cosmonauts include the Science Photo Library and the Hulton Archive, commercial picture libraries whose stock includes NASA pictures. Cosmonauts here are from the period of collaboration between Russia and the USA. Pictures of cosmonauts from the USSR period can also be ordered from the Russian Information Agency–Novosti (RIA-Novosti), whose London office retains an archive of photographs from the Soviet/Russian space programme. Finally, the British Interplanetary Society is a good source of space material, but is normally only open to its own members.

Addresses:

British Interplanetary Society, 27/29 South Lambeth Road, London SW8 1SZ; Tel: 020-7735-3160; Fax: 020-7820-1504; Email: [bis.bis@virgin.net](mailto:bis.bis@virgin.net); Web: <http://www.bis-spaceflight.com>.

Hulton Archive, Unique House, 21-31 Woodfield Road, London W9 2BA; Tel: 020 7266 2662 (Sales), 020 7579 5777 (Research); Fax: 020 7266 3154, 020 7266 2414; E-Mail: [hultonresearch@getty-images.com](mailto:hultonresearch@getty-images.com) (Research), [hultonsales@getty-images.com](mailto:hultonsales@getty-images.com) (Sales); Web: <http://search.hultongetty.com>.

Mary Evans Picture Library, 59 Tranquil Vale, Blackheath, London SE3 0BS; Tel: 020 8318 0034. Fax: 020 8852 7211; Web: <http://www.meppl.co.uk>.

Russian Information Agency–Novosti (RIA-Novosti), Web: <http://en.rian.ru/rian/index.cfm> (Russian HQ only). London office: 3 Rosary Gardens, London SW7 4NW; Tel: 020-7370-1873 (photo library); Fax: 020-7244-7875; Email: [photos@novosti.co.uk](mailto:photos@novosti.co.uk).  
Science Photo Library, 327-329 Harrow Road, London W9 3RB; Tel: 020-7432-1100; Fax: 020-7286-8668; Web: <http://www.sciencephoto.com>.

### **3. Archival sources**

Many archival sources are privately run, and in all cases it is normal courtesy to make preliminary contact by letter (enclosing s.a.e.) or telephone to ascertain whether it is possible to visit. Information is sometimes available on the relevant website.

American Institute of Physics, Center for History of Physics, One Physics Ellipse, College Park, MD 20740-3843, Email: [photos@aip.org](mailto:photos@aip.org), Web: <http://www.aip.org/history/esva/>, includes the Emilio Segre Visual Archives, focusing on 20<sup>th</sup> century American physicists and astronomers, but including many scientists in Europe and elsewhere, and in earlier times.

California Institute of Technology (Caltech), 1200 East California Boulevard, Pasadena, California 91125, Email: [archives@caltech.edu](mailto:archives@caltech.edu); Web: <http://archives.caltech.edu//photoNet.html>, contains the *Caltech Archives PhotoNet*, an online database containing thousands of images, including portraits.

International Index. At the Archenhold Observatory, East Berlin, the Director, Dr D.B.Herrmann, is compiling an international index of holdings of portraits of astronomers. A handlist of this up to 1984 by K. Friedrich is held at the RAS and more up to date information can be obtained by writing to Dr D.B.Herrmann, Director, Archenhold-Sternwarte, Alt-Treptow 1, 12435 Berlin, Germany, Email: [dbherrmann@astw.de](mailto:dbherrmann@astw.de). Note that they do not hold the portraits themselves but can supply guidance as to where they can be found.

Lick Observatory. An excellent source for portraits especially 20<sup>th</sup> century and American figures is the Mary Lea Shane Archives of the Lick Observatory, held at 359 McHenry Library, University of California, Santa Cruz CA 95064, Email: [lick@cats.ucsc.edu](mailto:lick@cats.ucsc.edu); Web: <http://library.ucsc.edu/library/collect/lickarchives>. The handlist of this collection is now available on their website, and is also available at the RAS, Lick Observatory, *Preliminary Finding Aid to the Archives of the Lick Observatory*, pp 43-54.

Museum of the History of Science, Image Library, Old Ashmolean Building, Broad Street, Oxford OX1 3AZ, Tel: 01865 277285; Fax: 01865 277288; Email: [photo-orders@mhs.ox.ac.uk](mailto:photo-orders@mhs.ox.ac.uk), Web: <http://www.mhs.ox.ac.uk/images/>, holds a large collection of photographs, including portraits of scientists and instrument makers.

NASA Johnson Space Center (JSC) Imagery Services, Web: <http://images.jsc.nasa.gov>, contains the *NASA JSC Digital Image Collection*, the most comprehensive NASA collection for portraits, which spans the whole manned space programme and includes portraits of cosmonauts for missions on which the USA and Russia collaborated. Images can be downloaded from its website; for publication-quality pictures, contact Media Resource Center, 2101 NASA Road 1, Building 423/AP32/IMPASS, Houston, TX 77058, USA.

National Portrait Gallery, St Martin's Place, London WC2H 0HE; Web: <http://www.npg.org.uk/live.index.asp> is the national repository of portraiture and has many portraits of British scientists. They can also supply references to portrait holdings in other repositories. Portraits in the Gallery's Primary Collection are held in the Picture Library; the Heinz Archive and Library should be contacted for more complex enquiries. Picture Library: Tel: 020 7312 2473/6; Fax: 020 7312 2464; Email: [picturelibrary@npg.org.uk](mailto:picturelibrary@npg.org.uk). Heinz Archive and Library: Tel: 020 7306 0055 ext 257; Fax: 020 7306 0056; Email: [archiveenquiry@npg.org.uk](mailto:archiveenquiry@npg.org.uk).

Royal Greenwich Observatory archives, now held by Cambridge University Library. These have a number of portraits including all the Astronomers Royal and some other figures connected with Greenwich Observatory. Contact Adam Perkins, Department of Manuscripts and University Archives, Cambridge University Library, West Road, Cambridge CB3 9DR, Tel: 01223 333000 (Enquiries); Fax: 01223 333160; Email: [ajp@ula.cam.ac.uk](mailto:ajp@ula.cam.ac.uk), Web: <http://www.lib.cam.ac.uk/Handbook/D12.html>.

Royal Society, 6 Carlton House Terrace, London SW1Y 5AG; Tel: 020-7451-2606; Fax: 020 7930 2170;  
Email: library@royalsoc.ac.uk; Web: <http://www.royalsoc.ac.uk> has numerous portraits mainly of former Fellows.

San Diego State University Library, Malcolm A. Love Library, 5500 Campanile Drive, San Diego CA 92182-8050, Web: <http://infodome.sdsu.edu/about/depts/spcollections/index.html>; Email: speccol@libweb.sdsu.edu holds the Ernst Zinner collection of portraits, mainly of astronomers, though many are secondary copies. This catalogue is now available on their website, and a handlist by G. Johns is also available for consultation.

Science & Society Picture Library, Web: <http://www.nmsi.ac.uk/piclib/>, has since 1998 represented the collections of the National Museum of Science and Industry, comprising the Science Museum, the National Museum of Photography, Film & Television, and the National Railway Museum. It can be contacted at the Science Museum, Exhibition Road, London SW7 2DD; Tel: 020-7942 4400; Fax: 020 7942 4401; Email: piclib@nmsi.ac.uk. It holds numerous portraits (not restricted to British subjects).

#### **4. Websites**

*Portrait Websites:*

*Astro Info Service*, <http://www.astroinfoservice.co.uk>. Their services include biographical profiles of astronauts and cosmonauts, with portraits, which will eventually be available by mail order; some of these can be downloaded from their website.

*MacTutor History of Mathematics Archive*, University of St Andrews, <http://www-history.mcs.st-and.ac.uk/history>. Portraits of many individuals are available, and can be downloaded as posters.

*NASA websites:*

These can be used to locate portraits of astronauts, and cosmonauts involved in US space missions. NASA does not currently make copies of images directly available to the general public, but images may be downloaded from its websites. Many of these offer multiple formats for the images, including high-resolution versions suitable for printing. Publication-standard copies of NASA images may also be obtained by media representatives or NASA research partners by contacting the Public Affairs Office of the responsible NASA Center- a good one for portraits is the Johnson Space Center (JSC); they may also be purchased from certain commercial sources – those in the UK include the Science Photo Library (q.v.) and the Hulton | Archive (q.v.). “Off-the-peg” NASA images and products are available from local science centres and planetaria.

*NASA Multimedia Gallery*, <http://www.nasa.gov/gallery/>. Portal for NASA’s photo, video, audio and arts galleries of NASA audio-visual products, including *NASA Image eXchange*. It is not a unified searchable data base.

*NASA Image eXchange (NIX)*, <http://nix.nasa.gov/>, is the first step towards a comprehensive online collection of NASA images, and comprises a web-based search engine for simultaneously searching one or more of NASA’s online image and photo collections; additional collections are gradually being added to the scheme.

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20 August 2002