

# Computing at the University of Leeds

Rae Earnshaw

# Overview

- Founding of the University of Leeds
- Founding of the Electronic Computing Laboratory
- Timeline of computing at Leeds
- Equipment and facilities
- 50 Years of computing at University of Leeds
- References

# Background of Prof Earnshaw

- University of Leeds – Russell Group
- Illinois Institute of Technology – private University, Chicago. IITRI
- Northwestern Polytechnical University, Xian, China
- George Washington University – private University – downtown DC – close by White House and NSF – Foggy Bottom – Dept of Electrical Eng and Computer Science
- 4 books with Professor Rogers at US Naval Academy, Annapolis, USA
- University of Bradford, Professor of Electronic Imaging
- <http://www.bradford.ac.uk/ei/electrical-engineering-and-computer-science/staff-profiles/profile/?u=raearnsh>
- Glyndwr University, Professor of Creative Industries

# University of Leeds, Parkinson Building



# University of Leeds, Royal Charter 1904

- The **University of Leeds** is a [redbrick university](#) located in the city of [Leeds](#), [West Yorkshire](#), England. Originally named the Yorkshire College of Science and later simply the Yorkshire College, it incorporated the [Leeds School of Medicine](#) and became part of the federal [Victoria University](#) alongside Owens College (which eventually became the [University of Manchester](#)) and University College Liverpool (which became the [University of Liverpool](#)).<sup>[5]</sup> In 1904, a [royal charter](#), created in 1903, was granted to the University of Leeds by [King Edward VII](#).<sup>[6]</sup>
- [http://en.wikipedia.org/wiki/University\\_of\\_Leeds](http://en.wikipedia.org/wiki/University_of_Leeds)

# University of Leeds

- The University of Leeds has around 33,500 students,<sup>[3]</sup> the eighth-highest number of any university in the UK.<sup>[7]</sup> From 2006 to present, the university has consistently been ranked second in the United Kingdom for the number of applications received, second only to the University of Manchester.<sup>[8]</sup>
- Leeds had a total income of £547.3 million in 2010/11, of which £124 million was from research grants and contracts.<sup>[9]</sup> The university has financial endowments of £49.3 million (2009–10), ranking outside the top ten British universities by financial endowment.

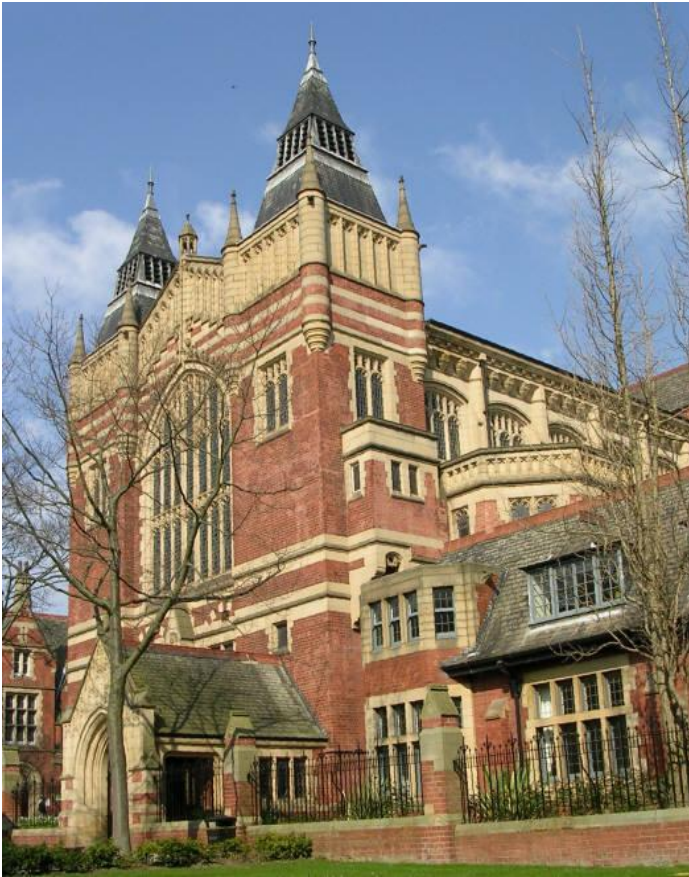
- The university is a founding member of the prestigious [Russell Group](#) of research-intensive universities and the [N8 Group](#) for research collaboration.<sup>[10]</sup>
- The university is also a founding member of the [Worldwide Universities Network](#), the [Association of Commonwealth Universities](#), the [European University Association](#), the [White Rose University Consortium](#), the [Santander Network](#) and [CDIO](#) and is also affiliated to the [Association of MBAs](#), [EQUIS](#) and [Universities UK](#).



|                                 |   |
|---------------------------------|---|
| Motto                           | <i><a href="#">Latin</a></i> : Et augebitur scientia  |
| Motto in English                | "And knowledge will be increased"   |
| Established                     | 1904 - University of Leeds<br>1887 - affiliated to the federal <a href="#">Victoria University</a><br>1831 - <a href="#">Leeds School of Medicine</a> |
| Type                            | <a href="#">Public</a>  |
| <a href="#">Endowment</a>       | <a href="#">£49.28 million</a> <sup>[1]</sup>   |
| <a href="#">Chancellor</a>      | <a href="#">The Lord Bragg</a>  |
| <a href="#">Vice-Chancellor</a> | <a href="#">Sir Alan Langlands</a>  |
| <a href="#">Visitor</a>         | <a href="#">Nick Clegg</a><br>As <a href="#">Lord President of the Council</a>  |
| Admin. staff                    | 8,000 <sup>[2]:3</sup>  |
| Students                        | 33,585 <sup>[3]</sup>   |
| <a href="#">Undergraduates</a>  | 24,080 <sup>[3]</sup>   |
| <a href="#">Postgraduates</a>   | 9,505 <sup>[3]</sup>  |



# Great Hall



# Letter from University Grants Committee, 1956

Ref: MA/01

UNIVERSITY GRANTS COMMITTEE,  
38, BELGRAVE SQUARE,  
LONDON, S.W.1.

24th May, 1956

## Electronic Digital Computers

My Committee have now considered the replies to the enquiry sent out in my circular letter of 18th October, 1955 and I am instructed to let you know that they have recommended to the Treasury that electronic digital computers should be provided for the following Universities:-

Durham (Newcastle Division)  
Leeds  
London  
Oxford  
Southampton  
Glasgow University

Computers are already available at Cambridge and Manchester Universities.

I am sending you this information so that you may know where it will be most convenient to make application for computer facilities.

Yours sincerely,

*George Mallaby*

# Electronic Computing Laboratory

- 1956 - Dept of Mathematics sets up the Electronic Computing Laboratory (ECL)
- 1957 - Dr Sandy Douglas CBE appointed as first Director
- [http://en.wikipedia.org/wiki/Sandy\\_Douglas](http://en.wikipedia.org/wiki/Sandy_Douglas)
- 1957 – University of Leeds acquires its first computer – Ferranti Pegasus – installed in the Eldon Chapel – a non-conformist church across the road from Chemistry. It cost £40K, dissipated about 30KW and failed several times each day. At today's prices it would cost £8 million

# Eldon Chapel, Woodhouse Lane

<http://www.leodis.net/display.aspx?resourceIdentifier=7043>



# First Programming Course, 1958

Registrar for information H.11.  
[This has already been  
circulated]  
17-12-58

## INTRA-MURAL COURSE ON PROGRAMMING FOR A PEGASUS COMPUTER

LENT TERM - 1958

The Laboratory proposes to hold an intra-mural programming course for the Pegasus machine early next term designed primarily for research students. The course will be designed to cover thoroughly the principles of program design and, at the end of it, students will be in a position to commence programming problems of their own. It is desirable that this course should be concentrated, rather than spread out over a term, since considerable practical work is involved. The suggested arrangement is, therefore, to hold a series of lectures and practical classes on Mondays, Wednesdays and Fridays from 2-5 p.m., for three weeks, commencing on Monday, 20th January.

Whilst the course is primarily intended for research students, it is hoped that Members of Staff will attend if they wish to do so. It is realised, however, that the times may prove inconvenient for them, and Members of Staff interested in learning programming but not able to attend the course are asked to contact the Director directly with a view to having special arrangements made for them.

Owing to limited facilities for practical work being available, it will be necessary to limit attendance on the course. Would Departments, therefore, please notify this Laboratory before December 17th of the names of any students who wish to attend the course and make observations on the proposed timetable, which will, if necessary, be modified.

A.S. Douglas.  
Director of Electronic Computing Laboratory.

# Time Line of Computing at Leeds

- 1956 - Dept of Mathematics sets up the Electronic Computing Laboratory (ECL)
- 1957 - Dr Sandy Douglas appointed as first Director
- 1957 – University of Leeds acquires its first computer – Ferranti Pegasus – installed in the Eldon Chapel – a non-conformist church across the road from Chemistry. It cost £40K, dissipated about 30KW and failed several times each day. At today's prices it would cost £8 million
- 1957 - Dr Geoffrey Cook appointed as Lecturer in Electronic Computing, and Deputy Director to Dr Sandy Douglas
- 1959 – first administrative use of the Pegasus to produce student lists and statistics (Windley, Jones, Kay)
- 1960 - Dr Sandy Douglas resigns to join a consulting organisation in operational research and data processing
- 1960 - Dr Geoffrey Cook appointed as Director of the Electronic Computing Laboratory (ECL)
- 1961 – appointment of Dr Mike Wells to Lectureship in ECL
- 1962 – appointment of Tony Wren to Lectureship in ECL. World's first locomotive schedule on a computer implemented by Tony Wren
- 1964 – English Electric KDF9 computer installed in the E.C.Stoner building – It cost £200K, had storage of 192Kbytes and a magnetic disk storage unit with 24Mbytes
- Design and implementation of the Eldon operating system by Mike Wells, David Holdsworth and Tony McCann – to support multi-access by 32 users on teletypes to create and edit files and run programs online – written in Algol 60, Fortran, or assembler – paper submitted to the Computer Journal 1969 - <http://comjnl.oxfordjournals.org/cgi/content/abstract/14/1/21> )
- 1965 – Dr Geoffrey Cook made the University's first Professor in Computational Science
- 1967 – Independent Dept of Computational Science is formed

# English Electric KDF9 Computer, 1970



# Paper tape reader, KDF9, 1970





# KDF9 Disk Drive being removed by crane, 1973, 24 MB, 16 disks, each 3 feet in diam



- 4 GB memory today



# Succeeded by -

- ICL 1906A
- Amdahl V7, 5860
- Prime
- Apollo
- Sun and Silicon Graphics servers and workstations
- PCs

# Professor Mike Wells

- Director of the Computer Laboratory following Prof Geoff Cook
- Also Director of JANET (UK networking)
- <http://www.grahamtall.co.uk/wgs1955/famous%20wgs/Mike%20Wells.htm>

# Visualization Group

- Following participation in a Visualization Workshop at Stanford University in June 1990, chaired by Prof Bert Hesselink (Stanford) and Dr Val Watson (NASA Ames Research Center), a Visualization Group was set up in the University of Leeds to co-ordinate developments in this area for the benefit of all researchers
- <http://dl.acm.org/citation.cfm?id=996913&dl=ACM&coll=D&CFID=969279549&CFTOKEN=98769380>
- Able to capitalise on the new Silicon Graphics workstations recently acquired by the University, and provide software and expertise to develop and support research applications
- <http://www.chilton-computing.org.uk/inf/literature/newsletters/gvn/p039.htm#s7>

# Publications on Visualization

Earnshaw R.A. and Wiseman N. **"An Introductory Guide to Scientific Visualization"**, Springer-Verlag, pp 156, July 1992, ISBN 0-387-54664-2.

**Foreword by Dr James H. Clark**, co-founder of three billion dollar companies - Silicon Graphics Inc, Netscape Communications Inc and Healthon Inc, USA, and former Professor at Stanford University

For more information see:

<http://link.springer.com/book/10.1007/978-3-642-58101-4>

<http://www.amazon.co.uk/An-Introductory-Guide-Scientific-Visualization/dp/3642634702>

[http://books.google.com/books/about/An introductory guide to scientific visu.html?id=kL8dAQAAMAAJ](http://books.google.com/books/about/An+introductory+guide+to+scientific+visu.html?id=kL8dAQAAMAAJ)

Brodie K.W., L. A. Carpenter, R. A. Earnshaw, J. R. Gallop, R. J. Hubbard, A. M. Mumford, C. D. Osland, P. Quarendon **"Scientific Visualization - Techniques and Applications"** Springer-Verlag, Berlin, Heidelberg, Jan 1992, ISBN 0-387-54565-4.

For more information see: <http://www.amazon.com/Scientific-Visualization-Applications-K-W-Brodie/dp/3540545654>

Brown J. R., R. A. Earnshaw, M. Jern, J. A. Vince, **"Visualization: Using Computer Graphics to Explore Data and Present Information"**, John Wiley & Sons Inc, pp 287, (with CD-ROM), ISBN 0-471-12991-7, 1995.

For more information see: <http://www.amazon.com/Visualization-Computer-Graphics-Explore-Information/dp/0471129917>

# Publications with Prof David F. Rogers (US Naval Academy)

Rogers D.F. and Earnshaw R.A. (eds.) 1987, "*Techniques for Computer Graphics*", Springer-Verlag ISBN: 3-540-96492-4, pp. 512

[http://www.amazon.co.uk/Techniques-Computer-Graphics-David-Rogers/dp/0387964924/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1425298810&sr=1-1&keywords=Rogers+and+Earnshaw%2C+%22Techniques+for+Computer+Graphics%22](http://www.amazon.co.uk/Techniques-Computer-Graphics-David-Rogers/dp/0387964924/ref=sr_1_1?s=books&ie=UTF8&qid=1425298810&sr=1-1&keywords=Rogers+and+Earnshaw%2C+%22Techniques+for+Computer+Graphics%22)

Rogers D.F. and Earnshaw R.A. (eds.) 1990, "*Computer Graphics Techniques - Theory and Practice*", Springer-Verlag ISBN: 0-387-97237-4, pp. 542

[http://www.amazon.co.uk/Computer-Graphics-Techniques-Theory-Practice/dp/3540972374/ref=sr\\_1\\_fkmr0\\_1?s=books&ie=UTF8&qid=1425298610&sr=1-1-fkmr0&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22](http://www.amazon.co.uk/Computer-Graphics-Techniques-Theory-Practice/dp/3540972374/ref=sr_1_fkmr0_1?s=books&ie=UTF8&qid=1425298610&sr=1-1-fkmr0&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22)

Rogers D.F. and Earnshaw R.A. (eds.) 1991, "*State of the Art in Computer Graphics - Visualization and Modelling*", Springer-Verlag ISBN: 0-387-97560-8, pp. 368

[http://www.amazon.co.uk/State-Art-Computer-Graphics-Visualization/dp/0387975608/ref=sr\\_1\\_fkmr1\\_3?s=books&ie=UTF8&qid=1425298657&sr=1-3-fkmr1&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22](http://www.amazon.co.uk/State-Art-Computer-Graphics-Visualization/dp/0387975608/ref=sr_1_fkmr1_3?s=books&ie=UTF8&qid=1425298657&sr=1-3-fkmr1&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22)

Rogers D.F. and Earnshaw R.A. (eds.) 1993, "*State of the Art in Computer Graphics - Aspects of Scientific Visualization*", Springer-Verlag ISBN: 0-387-94164-9, pp. 253

[http://www.amazon.co.uk/State-Art-Computer-Graphics-Visualization/dp/1461287324/ref=sr\\_1\\_fkmr1\\_1?s=books&ie=UTF8&qid=1425298657&sr=1-1-fkmr1&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22](http://www.amazon.co.uk/State-Art-Computer-Graphics-Visualization/dp/1461287324/ref=sr_1_fkmr1_1?s=books&ie=UTF8&qid=1425298657&sr=1-1-fkmr1&keywords=Rogers+D.F.+and+Earnshaw+R.A.+%28eds.%29+1987%2C+%22Techniques+for+Computer+Graphics%22)

# Left the University of Leeds in 1995

- To take the Chair in Electronic Imaging, and Headship of the Dept of Electronic Imaging and Media Communications, at the University of Bradford in Sept 1995
- Job advert – next slide
- For further information on work at Bradford see
- <https://sites.google.com/site/earnshawcareer/>

# Job Advert, University of Bradford

- Established chair in electronic imaging
- Objective is multidisciplinary education in electronic imaging technology and its creative uses, and provide a focus for research in these areas. The prime objective of the chairholder is to develop research and other postgraduate activities of the Dept and to take overall responsibility for the Dept and the undergraduate programmes
- The candidate will be expected to have expertise in electronic imaging and telecommunications and an interest in media production, particularly video, animation and multimedia. In addition, a candidates must have qualifications and experience in electrical engineering, computer science, or other relevant discipline, and proven managerial and personal qualities required to lead and develop a multi-disciplinary research and teaching unit. A successful record of obtaining research funding and in publication would be strong supportive evidence of these skills. International standing in electronic media technology would also be an additional recommendation.
- Further details and applications forms ref CEI/THES, Director of Personnel, University of Bradford BD7 1DP, Tel 01274-383105
- Closing date 17 March 1995



# Prof Geoff Cook, 1928-2006



- Unveiling of picture on 30 March 2007 at University of Leeds by Prof John Fisher, Deputy Vice-Chancellor with Prof Cook's family
- [http://www.leeds.ac.uk/secretariat/obituaries/2006/cook\\_geoffrey.html](http://www.leeds.ac.uk/secretariat/obituaries/2006/cook_geoffrey.html)

# 50 Years of Computing at the University of Leeds, 30 March 2007

- <http://www.comp.leeds.ac.uk/jubilee/>
- <http://www.comp.leeds.ac.uk/jubilee/Pictures/>
- Lunch – pictures –
- <http://www.comp.leeds.ac.uk/jubilee/Pictures/070330/>

# 30 March 2007

- On March 30th, a number of events were held:
  - Dr David Holdsworth gave an introduction to the afternoon.  
[Powerpoint](#) is available. Please attribute (Holdsworth) any use made of these
  - Dr Andrew Herbert (BSc Leeds 1975, Director of Microsoft Research, Cambridge): "*Why everything I learned at Leeds in 1972 is no longer true!*" or "*The Future of Software*"  
[Powerpoint](#) is available. Please attribute (Herbert and Microsoft Research) any use made of these
  - Eur. Ing. Peter Jesty gave a vote of thanks.  
[PDF](#) is available. Please attribute (Jesty and Peter Jesty Consulting) any use made of these.
  - A [webcast](#) of the afternoon is viewable
  - Many [photographs were taken](#).
- The [Jubilee Quiz](#) was held on 29th March and the questions are available to you
- See some [historical artefacts and faces](#) - we need help in identifying some of these

# 50 Year Celebration Lunch



# 50 Year Jubilee Lunch

Left to right: Tony McCann, Philip Hobley, Rosemary Abdo, Mike Wells, Rae Earnshaw, Robert Dewar, Colin Coghill, Jon Duke, Adrian Hock, Tony Denson



# Programme, 30 March 2007

- Dr David Holdsworth gave an introduction to the afternoon  
[Powerpoint](#) is available. Please attribute (Holdsworth) any use made of these
- Dr Andrew Herbert (BSc Leeds 1975, Director of Microsoft Research, Cambridge): *"Why everything I learned at Leeds in 1972 is no longer true!"* or *"The Future of Software"*  
[Powerpoint](#) is available. Please attribute (Herbert and Microsoft Research) any use made of these
- Eur. Ing. Peter Jesty gave a vote of thanks.  
[PDF](#) is available. Please attribute (Jesty and Peter Jesty Consulting) any use made of these

# Lecture by Dr Andrew Herbert, CEO Microsoft Research, UK



# University of Leeds

## Chief Executive Officers, 1963 -



# Sir Roger Stevens, 1906-1980

- Vice-Chancellor, University of Leeds, 1963-70
- Papers at Churchill College, Cambridge -  
<http://janus.lib.cam.ac.uk/db/node.xsp?id=EAD%2FGBR%2F0014%2FSTVS>
- [http://en.wikipedia.org/wiki/Roger\\_Stevens\\_%28diplomat%29](http://en.wikipedia.org/wiki/Roger_Stevens_%28diplomat%29)
- <https://100objectsbradford.wordpress.com/2011/07/18/22-yorkshire-roses-in-steel-the-university-of-bradford-mace/>



Presenting the Mace to the  
University of Bradford in 1966



# Lord Boyle of Handsworth, 1923-81

- Vice-Chancellor, University of Leeds, 1970-81
- Lord Boyle's papers –
  - <http://www.leeds.ac.uk/library/spcoll/handlists/081pt1MS660Boyle.pdf>
  - [http://en.wikipedia.org/wiki/Edward\\_Boyle,\\_Baron\\_Boyle\\_of\\_Handsworth](http://en.wikipedia.org/wiki/Edward_Boyle,_Baron_Boyle_of_Handsworth)



# Sir Edward Parkes, 1926-

- Vice-Chancellor, University of Leeds, 1983-91
- [http://en.wikipedia.org/wiki/Edward\\_Parkes](http://en.wikipedia.org/wiki/Edward_Parkes)



# Sir Alan Wilson, 1939-

- Vice-Chancellor, University of Leeds, 1991-2004
- Director General for HE, UK Govt, 2004-6
- Professor of Urban and Regional Systems, UCL, 07-
- <https://iris.ucl.ac.uk/iris/browse/profile?upi=AGWIL25>
- <http://alan.blogweb.casa.ucl.ac.uk/>
- [http://en.wikipedia.org/wiki/Alan\\_Wilson\\_%28academic%29](http://en.wikipedia.org/wiki/Alan_Wilson_%28academic%29)



# Professor Michael Arthur, 1954-

- Vice-Chancellor, University of Leeds, 2004-13
- President and Provost UCL, 2013-
- [http://en.wikipedia.org/wiki/Michael\\_Arthur\\_%28physician%29](http://en.wikipedia.org/wiki/Michael_Arthur_%28physician%29)
- [http://web.archive.org/web/20060116133537/http://www.leeds.ac.uk/about/senior\\_officers/arthur\\_cv.htm](http://web.archive.org/web/20060116133537/http://www.leeds.ac.uk/about/senior_officers/arthur_cv.htm)



# Sir Alan Langlands, 1952-

- Vice-Chancellor, University of Leeds, 2013-
- [http://en.wikipedia.org/wiki/Alan\\_Langlands](http://en.wikipedia.org/wiki/Alan_Langlands)



# References

- <http://www.cs.man.ac.uk/CCS/res/res49.htm#e>
- <http://nssdc.gsfc.nasa.gov/nost/isoas/dads/presentations/Holdsworth.html>
- *“Walks around Redbrick”*, M. Beresford
- <http://www.theguardian.com/uk/the-northerner/2013/mar/26/leeds-universityofleeds>
- <http://www.amazon.co.uk/Publications-Thoresby-Society-Second-Series/dp/0900741716>
- [http://en.wikipedia.org/wiki/University\\_of\\_Leeds](http://en.wikipedia.org/wiki/University_of_Leeds)
- *“27 Years in Computing at the University of Leeds”* – Reporter article
- <https://sites.google.com/site/27yearsincomputingatleeds/>