

The set of hearing-impaired mathematics PhDs is countably finite on the order of at least 23!!

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Revision of poster presented at IMA Workshop on Minorities and Applied Mathematics, University of Minnesota, April 22-24, 2005



THE DEPARTMENT OF BIOMEDICAL ENGINEERING

The Whitaker Institute at Johns Hopkins

Epidemiology of Hearing Impairment

- the incidence of hearing-impairment worldwide is roughly 1-in-10
- identified 22 mathematicians: there are probably more such as those late-deafened or those who have done mathematically intensive doctoral research in other subjects
- level of hearing-impairment varies widely:
 - born deaf (4 BD), adventitiously deaf (14 AD), late-deafened (4 LD)
 - profound (10 PRO), severe (5 SEV), hard of hearing (7 HOH)
 - 2 BD-PRO, 1 BD-HOH, 1 BD-SEV, 7 AD-PRO, 4 AD-SEV, 3 AD-HOH, 3 LD-HOH, 1 LD-PRO
- so where are the hearing-impaired mathematicians?
- according to AAAS Directory of Disabled Scientists and Engineers, a few studied mathematics and went into other fields e.g. Vinton G. Cerf who wrote the mail component of TCP/IP that led to the Internet
- hearing-impairment is invisible except at special colleges or programs such as Gallaudet University, National Technical Institute for the Deaf at Rochester Institute of Technology, California State University at Northridge and University of Durham, England

Hearing-impaired people with mathematics PhDs

NAME: 1st degree, PhD degree, specialty, current post, comment (if any)

- 1. Charlotte Angas Scott: University of London (despite “wrangler” ranking in mathematical tripos at Cambridge), University of London 1885, analytical geometry, Bryn Mawr College (1st woman to be chair of a mathematics dept), co-founder American Mathematical Society (AMS)**
- 2. Dame Kathleen Ollerenshaw: University of Oxford, University of Oxford 1945, number theory, UK education policy, President of Institute of Mathematics and its Applications (1976)**
- 3. Norman P. Herzberg: Columbia College, Massachusetts Institute of Technology 1964, number theory, Center for Communications Research**
- 4. Homer Bechtell: retired from University of New Hampshire, noted for writing a letter to Notices of AMS about need to speak clearly in seminars etc for the benefit of everyone not just those who cannot hear!**
- 5. Chuzo Okuda: Gallaudet University, Penn State Univ 1975, algebra, computer scientist at Lawrence Livermore National Labs**
- 6. Dimitri Kanevsky: Moscow State University, Moscow State University 1977, algebraic geometry, IBM Speech Recognition Group Leader at IBM Watson Research Center**
- 7. David James: Shimer College, University of Chicago 1977, differential topology, Howard University, African-American**

Hearing-impaired people with mathematics PhDs (cont'd)

- 8. Gary Cornell: University of Pennsylvania, Brown University 1978, algebraic number theory, University of Connecticut, popular author/publisher of programming books**
- 9. Terence Lyons: University of Cambridge, University of Oxford 1980, probability and analysis, University of Oxford, Wallis Professor of Mathematics and elected Fellow of the Royal Society in 2002**
- 10. Jacob Thadathil: University of Delhi, Case Western Reserve University 1983, applied (operations research), Director of Forsyth Center for Deaf and Hard of Hearing at Winston-Salem NC, Indian**
- 11. Sam Howison: University of Oxford, University of Oxford 1983, applied (fluid mechanics), University of Oxford, Director of Oxford Centre for Industrial and Applied Mathematics (OCIAM)**
- 12. Lawrence Somer: Cornell University, University of Illinois Urbana-Champaign 1985, algebra, Catholic University, Editor of Fibonacci Quarterly**
- 13. Fat Lam: Gallaudet University, University of Montana 1987, applied (operations research), Gallaudet University, Chinese and chair**
- 14. Tilak Ratnanather: University College London, University of Oxford 1989, applied (fluid mechanics), Johns Hopkins University, brain mapping and computational biology of the auditory system**

Hearing-impaired people with mathematics PhDs (cont'd)

- 15. Steve Baigent: University of Oxford, University of Oxford 1991, applied (fluid mechanics), University College London, computational biology**
- 16. Wojciech Jaworski: Nicolaus Copernicus University (actually Physics PhD), Queen's University 1991, analysis, Carleton University, Polish**
- 17. James Nickerson: Gallaudet University, University of Maryland 1995, K-theory, Gallaudet University**
- 18. Dan Kucerovsky: University of Western Ontario, University of Oxford 1995, operator theory and modern analysis, University of New Brunswick at Fredericton, Director of Center for Operator Analysis (COPAL)**
- 19. Mohammad Obiedat: Yarmouk University, Middle Eastern Technical University 1998, algebraic topology, Gallaudet University, Jordanian**
- 20. Kevin Hulsing: Rochester Institute of Technology, Virginia Polytechnic Institute and State University 1999, applied (control theory), Naval Surface Warfare Center Dahlgren**
- 21. Karen Horton Staley: University of California Davis, University of California Santa Barbara 2002, non-commutative algebra, North Dakota State University, National Security Agency.**
- 22. Sirong Zhang: University of Science and Technology of China, Johns Hopkins University 2004, geometry, postdoc with Ratnanather, Beihang University, China.**
- 23. Kenneth O'Neill: Strathclyde University, Strathclyde University 2012, Statistician, Scottish Government**

Comments

- how does one teach mathematical nuances such as:
“this singularity means that we have to scale it out in the form of a Taylor series expansion about its location”
- “*Mathematics is the one school subject not dependent on hearing*” Dame Kathleen Ollerenshaw (2004)
- can hearing-impaired students take advantage of the graphical power of the Internet?
- should interactive online books e.g. Mathwright (<http://www.cis.jhu.edu/~tilak/math.html>) be developed?: these could release the teacher from the burden of writing on the blackboard and focus on enhancing mathematical intuition
- web-based mathematics could attract those from under-represented communities as well
- can we identify more people through newsletters of mathematical societies such as AMS, SIAM, IMA (UK) etc

Primary sources

- although it has been difficult to obtain reliable information about other currently active mathematicians with significant hearing impairments, all but two on the list responded to enquiries
- AAAS Directory of Disabled Scientists and Engineers (V.W. Stern)
- H. G. Lang (1994), “The Silence of the Spheres: the deaf experience in the history of science”, Bergin & Garvey Press, Westport, CT.
- H. G. Lang and B. Meath-Lang (1995), “Deaf Persons in the Arts and Sciences: A Biographical Dictionary.” Greenwood Publishing Group, Westport, CT.
- <http://www.google.com>
- Digital Dissertations: <http://wwwlib.umi.com/dissertations/>
- Alexander Graham Bell Association for the Deaf and Hard of Hearing, Inc.
- <http://www.diversitycareers.com/>
- Dame Kathleen Ollerenshaw (2004), “To talk of many things”, University of Manchester Press.
- <http://www.theses.com>