

Curriculum Vitae

Professor David Tall MA, DPhil (Oxon), PhD (Warwick), FIMA, CMath.



Personal Statement

On retiring in the summer of 2006, I became Professor Emeritus in Mathematical Thinking at the University of Warwick.

I was educated at Wellingborough Grammar School where I developed my life-long interests in music, mathematics and people. At eighteen, I won an open scholarship to Oxford, obtaining a first class honours degree in mathematics and the Junior Mathematics Prize. My leisure interests included rugby, classical music and conducting choirs and orchestras. My first doctorate, a DPhil in mathematics at Oxford, was awarded for work on 'The Topology of Group Representations'.

I was appointed a Lecturer in mathematics at Sussex University in 1966 where I wrote my first text book on *Functions of a Complex Variable* and formed my own 'A Cappella Choir and Orchestra'. After three years, I moved to Warwick University as "Lecturer with Special Interests in Education". My interests continued (including 25 years as a conductor), writing mathematics text-books on *Foundations, Complex Analysis, Algebraic Number Theory* (with Ian Stewart), and researching mathematical thinking at all levels in school and university level.

In 1980, I made a career change to mathematics education, resolving to become both professionally qualified as a classroom teacher, and academically qualified by working for a second doctorate in education. I taught one day a week in schools, starting first with infants, then working through the age range in secondary and upper secondary school. For a year, I taught as a classroom teacher of eleven/twelve year-olds. This experience led to a life-time's personal commitment to build a theory of mathematical growth from childhood to maturity, gaining insight into the widening spectrum of performance as individuals grow older. I developed a theory of visualization conceptually supporting and complementing symbol-use, based on the insight of Shlomo Vinner into *concept image* and *concept definition* (Tall & Vinner 1981a).

I used this and empirical evidence on student thinking to develop a graphic approach to the calculus, leading the way internationally in the visualization of 'local straightness' as a foundation for differential calculus. This became the basis of my educational doctorate. My own research at university level led to the development of Advanced Mathematical Thinking as a coherent area of study in mathematics education (Tall (ed), 1992) with a group of international researchers. With Eddie Gray, I built a complementary theory of mathematical symbolism, developing the notion of procept as a symbol that can evoke both process and concept (Tall & Gray 1994a) giving rise to a theory of symbol development through arithmetic, algebra and calculus (Tall, et al, 2001a).

In 1992. I contracted sarcoidosis and, after a year away from work in 1993/4, I retired in 1995, retaining a one-third-time post as 'Professor in Mathematical Thinking' at the University of Warwick. Since then, I have benefited greatly from time to think and the stimulation of colleagues and research students. This has led to many new theoretical developments and invitations to present plenaries on my theories around the world.

I continue to develop a theory of the growth of mathematical thinking in different individuals from young child to adult based on empirical evidence. This led me to formulate the development in terms of *three worlds of mathematics*, the *conceptual-embodied*, the *operational-symbolic* and the *axiomatic-formal*, in which mathematical concepts are constructed through human perception, operation, and increasingly sophisticated forms of reasoning in each world. I integrated the cognitive and the affective aspects by introducing the notion of *met-before* where experiences met before may become *supportive* or *problematic* in new situations, encouraging generalization or impeding progress. I introduced the notion of *crystalline concept* to unify all three forms of conceptual construction, to give a full theory of *How Humans Learn to Think Mathematically*, published by CUP (NY) (2013). The majority of my articles are available from my web-site: http://www.warwick.ac.uk/staff/David.Tall.

Curriculum Vitae

Born May 15th 1941, Wellingborough, Northants, England.

Married Susan (née Ford) September 21st 1963.

Children:	Rebecca Jane	(September 24 1966)
	Christopher Spencer	(September 18 1970)
	Nicholas David	(May 30 1973)

Schools attended:

1945–52	Victoria Infant & Junior Schools, Wellingborough.
1952–60	The Grammar School, Wellingborough.

School Prizes

Junior Mathematics Prize,
Senior Mathematics Prize,
Senior Science Prize,
Senior Music Prize, Grade VIII viola, Grade VI violin,
1st XV Rugby colours, Northamptonshire Schools Rugby XV.

Public Examinations:

Oxford Local Examinations, General Certificate Education, O-level

1956	English Language, English Literature, French, Music,
	Mathematics, Physics, Chemistry, Biology.
1957	Latin, Religious Knowledge.
1958	Technical Drawing.

Oxford Local Examinations, General Certificate of Education, A-level

1958	Pure Mathematics (Distinction), Applied Mathematics (Distinction),
	Physics (Distinction), Chemistry (Distinction).
1959	Pure Mathematics (Scholarship level, Distinction),
	Applied Mathematics (Scholarship level, Distinction),
	Higher Mathematics (Distinction).

University Career

1960	State Scholarship & Open Scholarship, Wadham College Oxford.
10/1	Hannes Madaget in Mathematics First Class Hannes

- 1961 Honour Moderations, Mathematics, First Class Honours.
- 1963B.A. Mathematics, First Class Honours,
- Oxford University Junior Mathematics Prize.
- 1963–6 Graduate Study in Mathematics, Oxford.
- 1967 D.Phil. (Oxon), M.A. (Oxon).
- 1986 Ph.D. in Education (Warwick).
- 1986 Elected Fellow of the Institute of Mathematics and Its Applications.

Permanent Employment

1966–7	Assistant Lecturer in Mathematics, University of Sussex.
1967–9	Lecturer in Mathematics, University of Sussex.
1969–79	Lecturer in Mathematics with Special Interests in Education,
	University of Warwick.
1979–80	Lecturer in Mathematics Education, University of Warwick.
1980–89	Senior Lecturer in Mathematics Education, University of Warwick.
1989–92	Reader in Mathematics Education, University of Warwick.
1992-2006	Professor in Mathematical Thinking, University of Warwick.
2006-	Emeritus Professor in Mathematical Thinking, University of Warwick.
2011-2014	Visiting Professor in Mathematics Education, University of Loughborough

Other Appointments

Summer 1960	Temporary Science Teacher, The Grammar School, Wellingborough.
Spring 1970	Visiting Member, Institute for Advanced Study, Princeton, New Jersey, U.S.A.
Autumn 1978	Study Visit to the Hebrew University, Jerusalem, funded by the Royal Society.
Spring 1979	Visiting Professor, Concordia University, Montréal, Canada.
1979–86	Manager, Mathematics Education Research Centre, University of Warwick.
1980-81	Director, Mathematics Education Research Centre, University of Warwick.
1981-82	Full-time School Teacher, Woodloes Middle School, Warwick.
September 1982	Visiting Fellow in Music, University of Western Australia.
Spring 1985	Study Visit to Israel, funded by the Royal Society.
Spring 1986	Lecture Tour to USA & Canada, funded by the British Council.
Autumn 1986	Gastprofessor, I.D.M. Bielefeld, West Germany.
Spring 1990	Professor in Mathematics, Professor in Education, Purdue University, Indiana
	U.S.A.
September 1990	Consultant for "Diagnostic & Remedial Mathematics Group" Project,
-	Universiti Teknologi Malaysia, funded by the British Council.
1992–1995	Director, Mathematics Education Research Centre, University of Warwick.
1992 –1996	Member of European Committee for Mathematics Education.
Spring 1995	Visiting Professor, University of Rome, 'La Sapienza' (January/February).
March 1996	Study visit to Israel, funded by British Council.
June/July 1997	Visiting Professor at Auckland University, New Zealand, funded by British
-	Council.
Spring 2000	Visiting Professor, University of Rome, "La Sapienza" (March/April).
May 2000	Study visit to Thessaloniki and Athens, Greece, funded by the British Council.
October 2000	Consultant, Arizona State University, Pheonix, USA.
September 2000	Visiting Professor at Federal University of Minas Gerais, Brazil and University
	St Ursula, Rio De Janiero, Brazil.
Nov/Dec 2000	Visiting Academic, University of New England, Armidale, Australia.
Autumn 2002	Visiting Professor, Taiwan Normal University, Taipei, Taiwan.
Summer 2003	Consultant speaker, University of Crete.
2004-2007	Consultant, Purdue North Central, USA.
2006	Consultant, University of Massachusetts, USA
2011-2014	Visiting Professor, Loughborough University.
Ongoing	Invited international keynote speaker in Australia, New Zealand, USA, Spain,
	Greece, Germany, Cyprus, Finland, Japan, Abu Dhabi, USA, Brazil, Thailand,
	Israel, etc.

External Examining

- 1967–1987 Examiner for A-level Mathematics, Oxford Delegacy of Local Examinations.
 1971–1985 External Examiner for the B.Ed. in Mathematics and the B.Ed. for Serving Teachers, Sussex University.
- 1972–1973 External Examiner for the M.Sc. in Categorical Algebra, Sussex University.
- 1976–1981 Senior External Examiner for Science in the B.Ed., Hertfordshire Colleges.
- 1980–1983 External Examiner for the Diploma in Mathematics, Chester College.
- 1981–1986 External Examiner for the M.Sc. in Mathematics Education, Polytechnic of the South Bank.
- 1981–1985 External Examiner (subsequently Senior External Examiner) in Education, West Midlands College of Higher Education.
- 1982–1986 External Examiner for the B.Ed., B.A./B.Sc. (General), Liverpool University.
- 1984–1987 External Examiner for the B.Ed., B.A./B.Sc. (General), Lancaster University.
- 1986 Awarder for A-level Mathematics, Oxford Delegacy of Local Examinations.
- 1989–1992 External Examiner for the P.G.C.E., Hatfield Polytechnic.
- 1989–1993 External Examiner for the B.Sc. in Mathematics & Education, Loughborough University.
- 1992–1995 External Examiner for the M.Ed./B.Phil/Dip.Ed, Chester College.
- 1994–1996 External Examiner in Mathematics Education and History for the B.Sc. in Mathematics, Liverpool University.

Committees

- 1977–1982 Founder Committee Member of the British Society for the Psychology of Learning Mathematics, (now B.S.R.L.M.)
- 1977–1981 Editor of the Newsletter of B. S. P. L. M.
- 1978–1983 Founder Chairman of the Grainger Society & Editor of "Grainger Journal".
- 1980–1996 Founder Member of Advisory Board of "For the Learning of Mathematics".
- 1980–1981 Co-editor of the journal "Mathematics Education for Teaching".
- 1984–1992 Founder Member of the Mathematical Association Teaching Sub-Committee on Computers.
- 1985–1987 Chairman of the Mathematical Association Teaching Sub-Committee on "Using the Computer in the Mathematics Classroom".
- 1985–1992 Chairman of the PME Working Group on "Advanced Mathematical Thinking".
- 1988 Member of the N.C.T.M. Research Agenda Project in Algebra funded by the National Science Foundation.
- 1988–1992 Member of School Mathematics Team developing the 16–19 curriculum, Chairman of Group designing the "Numerical Methods" module.
- 1989–94 Editor of "Mathematics Review".
- 1992–96 Member of the Education Committee of the European Mathematical Society.
- 1997–2001 Member of the Education Committee of the London Mathematical Society.

Cultural & Other Activities

- 1960–1966 Member of the Oxford University Orchestra, including periods as principal viola and principal second violin.
- 1962–1966 President of the Wadham College Music Society.
- 1964–1966 Conductor of the Wadham College Orchestra, including première of Delius "Five Little Pieces", orchestrated by Eric Fenby.
- 1964–1966 Founder conductor of the Meryfeild Choral Society, Oxford.

- 1966 Musical Director of the Oxford Operatic Society for "Die Fledermaus".
- 1967–1969 Founder conductor of the "A Cappella Singers", "A Cappella Players", "Sussex University Brass Ensemble", including Russian Orthodox services for Metropolitan Anthony, Archbishop of Zurosch, chorus master for the British Première of "Lehrstück" by Hindemith & Brecht.
- 1970–1975 Musical Director, Leamington Spa Opera Group, including productions of "The Bartered Bride", "La Belle Hélène", "The Mikado", "The Gondoliers", "Die Fledermaus", "Cavalleria Rusticana", the British Amateur Première of "Fiddler on the Roof", and many concerts.
- 1970– Occasional productions at local theatres, original incidental music for plays, script & musical arrangements for "By George!" at the Talisman Theatre, Kenilworth, "Vintage Porter" at the Loft Theatre, Leamington Spa; Musical Director for several other productions, including "Oh What a Lovely War" at the Priory Theatre, "The Wizard of Oz" at the Loft Theatre, guest conductor of other choirs and ensembles.
- 1971–1972 Musical Director of the Blue Triangle Operatic Society for the production of "Mame" at the Belgrade Theatre, Coventry.
- 1972–1979 Principal Conductor of the Beauchamp Sinfonietta for over fifty concerts including single composer concerts devoted to Bach, Mozart, Beethoven, Tschaikovsky, Strauss & Gershwin, several premières of works by young British composers, première of 1890 Suite by Delius.
- 1976– Member of the Rotary Club of Kenilworth.
- 1983–4 President of the Rotary Club of Kenilworth.
- 1978–1983 Founder Chairman of the Percy Grainger Society.
- 1980–1986 Conductor of the Arden Consort.
- 1987–1988 Musical Director of Spa Opera, including productions of "Kiss Me Kate", "The Mikado", "Oklahoma!"
- 1991 Awarded the Bronze Medallion of the International Percy Grainger Society, (New York), for scholarship and service to the music of Percy Grainger.

Selected participation in conferences

- 1977 Inaugural Meeting of the International Group for the Psychology of Mathematics Education (PME), Utrecht [Netherlands].
- 1978 PME, Osnabrück [West Germany]; Hebrew University (Jerusalem), Haifa Technion, Tel Aviv University [Israel].
- 1979 Concordia (Montréal), Bishop's University (Québec) [Canada]; P.M.E., Warwick.
- 1980 ICME4, Berkeley [USA]; PME, Berkeley [USA]; Keynote, UHA conference for Swedish University Mathematics Teachers.
- 1981 PME, Grenoble [France].
- 1982 University of Melbourne, University of Western Australia, Western Australia Institute of Technology, Murdoch University (Western Australia). Main
- 1983 PME [Israel]; Eindhoven University [Holland]; Freiburg Pædagogical Hochschüle [W. Germany]; Mathematical Association Annual Conference (Exeter).
- 1984 Paris [France]; Utrecht [Netherlands]; Universiteit Leuven (Campus Kortrijk) [Belgium]; British Mathematical Colloquium (Bristol).
- 1985 Hebrew University (Jerusalem), Weizmann Institute, Tel Aviv University, The Technion (Haifa) [Israel]; ICMI conference, Strasbourg (France); PME [Netherlands]; Universität Bielefeld [W. Germany].
- 1986 Harvard University, South East Massachusetts University, Cornell University [USA]; Concordia University (Montréal), Université de Québec à Montréal, Université Laval (Québec), Hamilton University, Brock University, Waterloo University (Ontario) [Canada]; Université Grenoble [France]; École d'Été, Orléans [France]; PME, London; Roskilde University [Denmark]; Universität Bielefeld, Technische Universität – Berlin, Universität Münster, Universität Dortmund [W. Germany].
- 1987 Glasgow University, Edinburgh University, Aberdeen IMA [Scotland]; Georgia [USA], (as only invited European participant in the NCTM–NSF Research Agenda Project for the Teaching and Learning of Algebra), State University of Illinois, Berkeley (California); Roskilde University [Denmark]; Mathematical Association Annual Conference (London); International Federation of Information Processing, Sofia [Bulgaria]; Flemish-Speaking Mathematics Teachers' Association [Belgium]; PME (Montréal) [Canada]; Vreje Universiteit, Amsterdam [Netherlands].
- 1988 TME, Antwerp, [Belgium]; PME, Vesprèm, [Hungary]; ICME, Budapest [Hungary]; Paris [France].
- 1989 Michigan State University, Ohio State University, Illinois State University, Opening Plenary Lecture – Special Interest Group for Research in Mathematics Education at NCTM annual meeting in Orlando, Florida [USA]; PME Paris; Janos Bolyai Society – Budapest, Hungary; Nee Ann Polytechnic – Singapore.
- 1990 Purdue [USA]; Concordia [Montréal, Canada]; Ohio State [USA]; NCTM [Utah, USA]; NATO Seminar [Cranfield, UK]; Universiti Teknologi Malaysia.
- 1991 Plenary Speaker at the Annual Meeting of the Professors of Mathematics in the Canary Islands; University of Valencia [Spain]; University of Warsaw [Poland]; P.M.E. Assisi [Italy]; Edinburgh [Scotland]; 4th International Conference on Technology in Collegiate Mathematics, Portland Oregon [USA].
- 1992 Plenary Speaker, MAA National Meeting, Baltimore, MD [USA]; Invited visit to National University & National Normal University, Taipei, [Taiwan]; Universiti Teknologi Malaysia, Universiti Kebangsaan Malaysia; PME, Durham, New Hampshire [USA], ICME, Québec, [Canada], Queensland University of Technology, Brisbane [Australia], 5th International Conference on Technology in Collegiate Mathematics,

Chicago [USA], University of Illinois, Northern Illinois University [USA], International Schools Association, Rome [Italy].

- 1993
- 1994 Plenary Speaker at CIEAEM Conference, Tolouse [France], PME Lisbon [Portugal]; Invited ICMI Speaker at the International Congress of Mathematicians, Zurich [Switzerland]; Invited Speaker, 7th International Conference on Technology in Collegiate Mathematics, Orlando [USA]; Galway [Eire].
- 1995 Invited visit to University of Rome, La Sapienza (as Visiting Professor), University of Pisa [Italy]; Open Lecture, Belfast [N. Ireland], Consultant, Barcelona [Spain]; Plenary Speaker, PME Recife [Brazil], Belo Horizonte [Brazil], Rio De Janeiro [Brazil]; NKATE conference, Kentucky [USA]; University of Kentucky, Lexington [USA]; Purdue University North Central [USA]; Plenary Speaker, University Mathematics Teaching Conference, Nottingham [UK], Invited seminar, Oberwalfach [Germany]; ESRC Seminar on Proof [London].
- 1996 Invited Speaker MA/AMS meeting, Orlando, USA; Tel Aviv University, Weizmann Institute, Israel] (Funded by British Council), Plenary Speaker, International Congress of Mathematics Education 8, [Spain], Plenary panelist, RUMEC, Central Michigan [USA], Plenary speaker, AMATYC Conference, [USA].
- 1997 Invited Speaker, MA/AMS meeting, San Diego, USA; Invited Speaker, MERGA Conference, Rotorua, New Zealand, Auckland University (as Auckland University Foundation Visitor), Waikato University, Victoria University (Wellington), Canterbury Mathematics Association (Christchurch), University of Otago, Otago Mathematics Association (Dunedin).
- 1998 Invited Speaker, MA/AMS meeting, Baltimore, [USA], Final Plenary Speaker, Mathematical Association Annual Conference, Warwick, [UK]; Plenary Speaker, International Conference on the Teaching of Mathematics, Samos, [Greece]; Plenary Speaker, UCSMP Fourth International Conference on Mathematics Education, Chicago, [USA]; Plenary Speaker, International Symposium zur Didaktik der Mathematik, Klagenfurt, [Austria].
- 1999 Münster University, Bielefeld University, Dortmund University [Germany], Plenary Speaker, Mathematics Education Conference, Thessaloniki [Greece];
- 2000 Rome La Sapienza, (Visiting Professor), University of Macedonia supported by British council, plenary speaker at national conference of mathematics educators Athens, [Greece], Visiting professor giving seminar series at Federal University of Minas Gerais, Federal University of Rio de Janiero, St Ursula University Rio de Janiero [Brazil], Visiting Academic University of New England, [Australia], Plenary speaker at TIME2000, [New Zealand], Plenary speaker at ATCM2000 [Thailand].
- 2001 Invited participant 'Research in using Technology in Teaching and Learning Mathematics', Penn State University, [USA]; PME25, Utrecht, [Netherlands], Plenary Lecture at SEMT, Prague, [Czech State]; Invited Plenary at RUME, Chicago, University of Massachusetts, University of Chicago [USA].
- 2002 Plenary Speaker, *Coloquio de Historia e Tecnologia no Ensino de Matemática*, Rio de Janiero [Brazil], Main speaker, Bogota [Columbia], PME 26, Norwich [UK], Plenary Speaker at conference on *Understanding Proof and Proving to Understand*, National Taiwan Normal University, Taipei, Plenary Speaker at *Conference on Research Methods in Mathematics Education*, Taitung, plus invited talks at Ilan Teacher's College, Taichung, Hsinchu, etc [Taiwan].
- 2003 Invited speaker for 3 seminars at the National Graduate School of Mathematics Education, Nafplion, Greece, Six seminars at the University of Crete.

- 2004 Invited speaker at the Universidade Estado do Rio De Janeiro [Brazil], and Pontifícia Universidade Católica De São Paulo [Brazil]; Consultant at Purdue University North Central, Indiana, [USA]; Plenary speaker Topic Subgroup on Teaching Calculus at ICME-10, Copenhagen [Denmark]; PME 28, Bergen [Norway]; Plenary Speaker, University of Marmara [Turkey]; University of Cyprus.
- 2005 CERME-4, Barcelona [Spain]; BCME-6, Warwick [UK]; Plenary Speaker, Conference: L'enseignement des mathématiques de la prime enfance à l'age adulte, Mons [Belgium]; Consultant at Purdue University North Central, Indiana, [USA]; Consultant at Weizmann Institute [Israel], invited visits to Haifa Technion, Jerusalem, Tel Aviv University, Ben Gurion University; invited speaker, Café Scientifique, Tel Aviv, supported by British Council; Plenary Speaker at Fifth Southern Hemisphere Symposium on Undergraduate Mathematics and Statistics Teaching and Learning, Fraser Island, Australia, invited visits to Queensland University of Technology, Brisbane, Auckland University [New Zealand], University of New England [Australia].
- 2006 NSF Project, Symbolic Cognition Project, Vermont, [USA]; Invited Seminar Series at the 25th Anniversary meeting of the 'Isaac Newton' Mathematical Society of the Canary Islands, [Gran Canaria]; Café Scientifique, Athens, supported by British Council; PME 30, Prague [Czech State]; Conference in Honour of David Tall and Eddie Gray, Prague [Czech State]; Invited sequence of seminars, University of Cyprus; invited participant, Explanation and Proof in Mathematics: Philosophical and Educational Perspectives, University of Duisburg-Essen; Keynote Speaker, APEC-Tsukuba International Conference, Tokyo [Japan], Invited speaker, Helsinki [Finland].
- 2007 Keynote Speaker, *Research in Undergraduate Mathematics Education*, San Diego USA], Invited Plenary, 3rd Conference of *Middle East Teachers of Science, Mathematics and Computing*, Abu Dhabi; Invited lecture tour to Taiwan, Consultant at Purdue University North Central, Indiana, [USA], Keynote Speaker, APEC Conference, Khon Khaen Thailand; Federal University of Rio De Janeiro [Brazil], and Pontifícia Universidade Católica De São Paulo [Brazil]; Invited visitor, Technion, Israel; ICMI study group on Proof, Germany.
- 2008 Plenary Speaker, HTEM conference, Rio De Janeiro [Brazil]; Severino Sombra University, Vassouras [Brazil]; UNIBAN São Paulo [Brazil].
- 2009 Seminar, University of Massachusetts at Dartmouth [USA], Program Committee member on *ICMI Study on Proof,* Taipei [Taiwan].
- 2010 Invited Speaker, University of Twente, [Netherlands], Plenary Speaker at *Encuentro Nacional e Internacional sobre la Enseñanza del Cálculo*, Universidad Tecnológica de Puebla, [Mexico], Invited speaker at Instituto Politécnico Nacional, Mexico City [Mex; Invited Speaker and Plenary Presenter at *APEC Conference on Lesson Study*, Chiang Mai, [Thailand].
- 2011 Invited Speaker at Conference on *Mathematicians and Mathematics Educators: ongoing collaborations*, University of Warwick [UK]; Consultant on NSF project, Purdue University North Central [USA].
- 2012 Plenary Speaker at *Symposium in Honor of Ted Eisenberg*, Ben Gurion University [Israel].
- 2013 Plenary speaker

Selected Invited National and International Keynote Addresses and Plenaries

- 1980 UHA conference for Swedish University Mathematics Teachers. St Andrew's Scotland: Keynote presentation: *Concept Image and Concept Definition in Mathematics*.
- 1982 University of Western Australia: Percy Grainger Centenary: Opening Plenary: *The Music of Percy Grainger*.
- 1983 Mathematical Association Annual Conference, Exeter: Plenary Lecture: Computers in Mathematics Education.
- 1985 ICMI conference, Strasbourg (France): Visualising calculus concepts using a computer.
- 1986 École d'Été, Orléans, France, Plenary Using the computer to represent calculus concepts.
- 1987 NCTM–NSF Research Agenda Project for the Teaching and Learning of Algebra) Flemish-Speaking Mathematics Teachers' Association [Belgium], *Seeing is Believing*.
- 1988 TME, Antwerp, [Belgium]: ICME, Budapest [Hungary]: *Mathematics 15–19 in a Changing Technological Age*
- 1989 Opening Plenary Lecture Special Interest Group for Research in Mathematics Education at NCTM annual meeting in Orlando, Florida [USA]; PME Paris; Janos Bolyai Society – Budapest, Hungary; Nee Ann Polytechnic – Singapore.
- 1990 NATO Seminar [Cranfield, UK]; Universiti Teknologi Malaysia.
- 1991 Plenary Speaker at the Annual Meeting of the Professors of Mathematics in the Canary Islands; University of Valencia [Spain] Edinburgh [Scotland]; 4th International Conference on Technology in Collegiate Mathematics, Portland Oregon [USA].
- 1992 Plenary Speaker, MAA National Meeting, Baltimore, MD [USA]; Invited visit to National University & National Normal University, Taipei, [Taiwan] ICME, Québec, [Canada], Queensland University of Technology, Brisbane [Australia], 5th International Conference on Technology in Collegiate Mathematics, Chicago [USA].
- 1994 Plenary Speaker at CIEAEM Conference, Tolouse [France] Invited ICMI Speaker at the International Congress of Mathematicians, Zurich [Switzerland]; Invited Speaker, 7th International Conference on Technology in Collegiate Mathematics, Orlando [USA]; Galway [Eire].
- 1995 Open Lecture, Belfast [N. Ireland], Plenary Speaker, PME Recife [Brazil], Plenary Speaker, University Mathematics Teaching Conference, Nottingham [UK.]
- 1996 Invited Speaker MA/AMS meeting, Orlando, USA; Plenary Speaker, International Congress of Mathematics Education 8, [Spain]; Plenary panelist, Research in Undergraduate Mathematics Education Conference, Central Michigan [USA]; Plenary speaker, AMATYC Conference, [USA].
- 1997 Invited Speaker, *MA/AMS* meeting, San Diego, [USA]; Invited Speaker, *MERGA* Conference, Rotorua, [New Zealand], Auckland University (as Auckland University Foundation Visitor), Waikato University, Victoria University (Wellington), Canterbury Mathematics Association (Christchurch), University of Otago, Otago Mathematics Association (Dunedin).
- 1998 Invited Speaker, MA/AMS meeting, Baltimore, [USA]; Final Plenary Speaker, Mathematical Association Annual Conference, Warwick, [UK]; Plenary Speaker, International Conference on the Teaching of Mathematics, Samos, [Greece]; Plenary Speaker, UCSMP Fourth International Conference on Mathematics Education, Chicago, [USA]; Plenary Speaker, International Symposium zur Didaktik der Mathematik, Klagenfurt, [Austria].
- 1999 Münster University, Bielefeld University, Dortmund University [Germany]; Plenary Speaker, Mathematics Education Conference, Thessaloniki [Greece];

- 2000 Plenary speaker at national conference of mathematics educators Athens, [Greece], Plenary speaker at *TIME2000*, Auckland [New Zealand]; Plenary speaker at *ATCM2000*, Thailand.
- 2001 Plenary speaker at *SEMT 2001*, Prague, [Czech Republic]; Invited Plenary speaker at *SIG-RUME*, Chicago, USA.
- 2002 Plenary speaker at Colloquium on History & Technology in Mathematics Teaching, Rio de Janiero, [Brazil]; Main speaker, Seminar: Aspectos Cognitivós del Aprendizaje del Cálculo Con Apoyo Tecnologico, Bogota, [Columbia]; Plenary speaker in conference on Understanding Proof and Proving to Understand, National Normal University, Taipei, Taiwan.
- 2003 Invited speaker at the National Graduate School of Mathematics Education, Nafplion, Greece; Invited speaker at the University of Crete.
- 2004 Invited speaker at the Universidade Estado do Rio De Janeiro [Brazil], and at the Pontifícia Universidade Católica De São Paulo [Brazil], Consultant at Purdue University North Central, Indiana, [USA], Plenary speaker Topic Subgroup on Teaching Calculus at *ICME-10*, Copenhagen, [Denmark]; *PME 28*, Bergen [Norway], Plenary Speaker, *National Conference on Science Education*, Marmara University [Turkey]; invited speaker, University of Cyprus, Nicosia [Cyprus].
- 2005 CERME-4, Barcelona [Spain]; BCME-6, Warwick [UK]; Plenary Speaker, Conference: L'enseignement des mathématiques de la prime enfance à l'age adulte, Mons [Belgium]; Consultant at Purdue University North Central, Indiana, [USA]; Consultant at Weizmann Institute [Israel], invited visits to Haifa Technion, Jerusalem, Tel Aviv University, Ben Gurion University; invited speaker, Café Scientifique, Tel Aviv, supported by British Council; Plenary Speaker at Fifth Southern Hemisphere Symposium on Undergraduate Mathematics and Statistics Teaching and Learning, Fraser Island, [Australia]; invited visits to Queensland University of Technology, Brisbane [Australia], Auckland University [New Zealand], University of New England [Australia]
- 2006 Invited participant in meeting on *Symbolic Cognition*, Vermont [USA], *Café Scientifique*, supported by British Council, Athens [Greece]; Plenary Lectures to the Newton Mathematical Society of the Canary Islands [Spain], *Conference in honour of Eddie Gray and David Tall*, Prague [Czech State]; Invited speaker, Proof Conference in Duisberg, [Germany]; Four seminars at University of Cyprus [Cyprus]; Plenary Lecture in Tokyo, [Japan]; Invited Lecture, Helsinki, [Finland].
- 2007 Plenary Lecture at RUME Conference in San Diego, [USA]; Plenary Lecture at *METSMaC2007 Teachers' Conference*, [Abu Dhabi]; Plenary Lectures at Changhua and Taitung and country-wide lecture tour to Hualien, Taipei, Hsinchu, Chiayi [Taiwan]; N.S.F. consultant, Purdue North Central, Indiana [USA], Invited participant and plenary presenter at *APEC Conference on Lesson Study*, Khon Kaen, [Thailand]; Visiting professor at the Haifa Technion as main speaker at meetings in Haifa, Tel Aviv, [Israel]; Invited participant at ICMI Study meeting on Proof, Essen, [Germany].
- 2008 Plenary Speaker, HTEM conference, Rio De Janeiro [Brazil], Severino Sombra University, Vassouras [Brazil], UNIBAN São Paulo [Brazil].
- 2009 Invited Seminar, University of Massachusetts at Dartmouth [USA], Program Committee member on ICMI Study on Proof Taipei [Taiwan].
- 2010 Invited Speaker, University of Twente, [Netherlands], Plenary Speaker at *Encuentro Nacional e Internacional sobre la Enseñanza del Cálculo*, Universidad Tecnológica de Puebla, [Mexico], Invited speaker at Instituto Politécnico Nacional, Mexico City [Mex; Invited Speaker and Plenary Presenter at *APEC Conference on Lesson Study*, Chiang Mai, [Thailand].

- 2011 Invited Speaker at Conference on *Mathematicians and Mathematics Educators: ongoing collaborations*, University of Warwick [UK]; Consultant on NSF project, Purdue University North Central [USA].
- 2012 Plenary Speaker at Symposium in Honor of Ted Eisenberg, Ben Gurion University, Israel.
- 2013 Plenary Speaker at HTEM Conference, Sao Carlos, Brazil.

David Tall

Theses on Mathematics Education & Mathematics Education

- 1967 "The Topology of Group Representations", D. Phil. Thesis in Mathematics (Oxford) [Supervisor: Professor Michael Atiyah]
- 1986 "Building and Testing a Cognitive Approach to the Calculus using Interactive Computer Graphics", Ph.D. Thesis in Education (Warwick) [Supervisor: Professor Richard Skemp]

PhD & MSc Students (by research)

John D. Monaghan, (1981–1986). Adolescent's Understanding of Limits and Infinity. (PhD, 1986).

- Michael O. J. Thomas, (1983-88) The Effects of BASIC Computer Programming on the Understanding of the Use of Letters as Variables in Algebra, (MSc, 1985), Conceptual Approach to the Early Learning of Algebra Using a Computer, (PhD, 1988).
- Norman Blackett, (1985-90). Computer Graphics and Children's Understanding of Linear and Locally Linear Graphs, (MSc, 1987). Developing Understanding of Trigonometry in Boys and Girls using a Computer to Link Numerical and Visual Representations, (PhD, 1990).

Lan Li, (1990–92). Studying Functions and Limits Through Programming, (MSc 1992).

- MdNor Bakar, (Jan 1991– Dec 1993). What Do Students Learn About Function? A Cross-cultural Study in England and Malaysia. (PhD 1993).
- Eddie M. Gray, (1990–1993) Qualitatively Different Approaches To Simple Arithmetic (PhD, 1993)
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Computer Software

(Details of programs mentioned elsewhere)

Supergraph (Glentop Press Ltd) for the BBC B, Master, Compact, Nimbus PC & Archimedes:

- Supergraph
- Superzoom
- Super3D
- Implicit Graphs

Graphic Calculus I (Glentop Press Ltd) for the BBC B, Master, Compact, Nimbus PC & Archimedes:

- Magnify
- Gradient
- The Blancmange Function

Graphic Calculus II (Glentop Press Ltd) for the BBC B, Master, Compact, Nimbus PC & Archimedes:

- Antiderivative
- Area
- Simpson

Graphic Calculus III (Glentop Press Ltd) for the BBC B, Master, Compact, Nimbus PC & Archimedes:

- 1st order differential equations
- 2nd order differential equations
- Simultaneous first order differential equations.

Graphic Calculus IV: Numerical Solutions of Equations (Rivendell Software) for the BBC computer, Nimbus PC & Archimedes computer:

- Bisection and Decimal Search
- False Position and the Secant Rule
- The Newton Raphson Method
- Solution by Iteration

Chords (published by A.U.C.B.E.) for BBC B, Master, Compact, Nimbus PC, Archimedes.

132 Short programs – design of overall pack and loading program for BBC B, Master, Compact, Nimbus PC, Archimedes.

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Real Functions and Graphs (Rivendell Software, publication for SMP trials prior to publication with Cambridge University Press), for the BBC computer, Nimbus PC & Archimedes computer:

- The Function Analyser
- The Function Calculator
- The Parametric Analyser
- The Solution Sketcher
- Newton-Raphson
- Iterate

Graphix (with Piet Blokland & Douwe Kok) (CoMet verlag, Duisburg, West Germany), comprising the following computer software for IBM compatibles and documentation in German (1989)

- Looking for the formula
- Draw Graphs
- Magnify
- Gradient (Differentiation)
- Area (Integration)
- Solving equations (f(x)=0 and f(x)=x)
- Taylor polynomials
- Blancmange
- Parametric representation of curves
- Curves in Space
- Functions of two variables
- Complex functions
- Differential equations
- Second order differential equations
- Simultaneous differential equations

A Graphic Approach to the Calculus (English version of Graphix) published by Sunburst Inc, USA, for IBM compatibles (1990).

Real Functions and Graphs for the BBC computer, Master, Compact, Nimbus PC & Archimedes (A3000) computer (Cambridge University Press) (Notes 58 pp.) (1991)

- The Function Analyser
- The Function Calculator
- The Parametric Analyser
- The Solution Sketcher

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- Bisection and decimal search
- False Position & Secant
- Newton-Raphson
- x = g(x) iteration

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- 1991 Lord Maxwell's Goodnight, (arr. Male Voices), Bardic Edition.
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- 1993 Early one Morning (Traditional, arr Grainger, ed. Tall), mixed chorus, Bardic Edition.
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