CURRICULUM VITAE

Vagn Lundsgaard Hansen

Name: Vagn Lundsgaard Hansen.

Born: September 27, 1940 in Vejle, Denmark.

Marriage: Married 1964 to Birthe Broeng,
Three children: Hanne (born 1965), Helle (born 1972), Martin (born 1979).

Honours: Knight of the Order of Dannebrog, 1993; 1st class, 2010.
The G.A. Hagemann Gold Medal, Technical University of Denmark, 2011.
Fellow of the American Mathematical Society (inaugural class), 2012.

Address: Brønsholmdalsvej 18, DK-2980, Kokkedal, Denmark.

Affiliation: Professor of Mathematics,
Technical University of Denmark,
DK-2800 Kgs. Lyngby, Denmark.

Degrees:

1960   Studentereksamen, Vejle Gymnasium.

1966   Naturvidenskabelig Embedseksamen (Mathematics and Physics),
Aarhus Universitet.

1972   Doctor of Philosophy (Mathematics), University of Warwick, England.

Positions held:

1966 – 1967   Instructor (Kandidatinstruktor), Aarhus Universitet.

1967 – 1969   Assistant professor (Amanuensis), Aarhus Univetsitet.

1969 – 1972   Research fellow (Kandidatstipendiat), University of Warwick, England.

1972 – 1980   Associate professor (Lektor), Københavns Universitet.

1980 –   Professor of Mathematics, Danmarks Tekniske Universitet (DTU). Emeritus 2010.

1986   Visiting professor (Fall term), University of Maryland, College Park, USA.

2005 – 2008   Scientific Director, LearningLab DTU, Danmarks Tekniske Universitet.

Membership of learned societies:

1982   Member of the Danish Academy of Natural Sciences
President 1984 – 2020.

2004   Fellow of the European Academy of Sciences.

2008 – 2012   President of the Danish Mathematical Society.

Selected research appointments:

1992 – 1998	Member of "Statens Naturvidenskabelige Forskningsråd" (The Danish Natural Science Research Council). Vice chairman 1993 – 95 and 1996 – 98.
1992 – 2000	Member of "Nordisk Publiceringsnævn for Naturvidenskab" (The Nordic Publishing Board in Science). Vice chairman 1996 – 97. Chairman 1998 – 2000.
2003 – 2009	Member of "Udvalgene Vedrørende Videnskabelig Uredelighed" (The Danish Committees on Scientific Dishonesty).
1994	Member of panel to evaluate 'INTAS-1994 proposals,' Bruxelles.
1994 – 1995	External examiner of the research at "Danmarks Lærerhøjskole" (The Royal Danish School of Educational Studies) appointed by the Rector upon the recommendation of "Statens Humanistiske Forskningsråd" (The Danish Research Council for the Humanities).
1996 –	Expert, evaluation of INTAS proposals.
1999 –	Referee, the Research Council of Norway.

Selected educational appointments:

1983 – 2011	Govening board of "Folkeuniversitetet i København."
1990	Member of committee appointed by the Minister of Education to evaluate the quality of the mathematical education and the teaching of mathematics in Denmark on all levels.
1994 – 1997	Member of International Planning Committee for an ICMI Study on "Perspectives on the teaching of geometry for the 21st century" appointed by the International Commission on Mathematical Instruction.
1995 – 1996	External examiner of mathematical education in Norway appointed by the Minister of Church, Education and Research.
2003	Member of the Jury at the 15th European Union Contest for Young Scientists, Budapest, Hungary, September 20–26, 2003.
2004	Member of the Jury at the 16th European Union Contest for Young Scientists, Dublin, Ireland, September 25–29, 2004.
2005	Member of the Jury at the 17th European Union Contest for Young Scientists, Moscow, Russia, September 17–22, 2005.
2007	President of the Jury at the 19th European Union Contest for Young Scientists, Valencia, Spain, September 14–19, 2007.
2008	Vice-President of the Jury at the 20th European Union Contest for Young Scientists, Copenhagen, Denmark, September 19–26, 2008.
2010 –	Formand for Juryen for Unge Forskere i Danmark.

University administration (selected):

1977 – 1979	Chairman of "Det Naturvidenskabelige Fakultetsstudienævn" (Educational Committee for Science), Københavns Universitet.
1985 – 1989	Chairman of "Matematisk Institut," DTU.
1988 – 1993	Dean of Faculty of Mathematics and Physics, DTU.
1993 – 1994	Chairman of advisory committee for Mathematics, Informatics and Physics, DTU.

Appreciation of mathematics (selected):

1995 – 2000	Chairman of the World Mathematical Year 2000 committee appointed by the European Mathematical Society.
1996	Chairman and organizer of Round Table on Mathematical Education at the 2nd European Congress of Mathematics, Budapest, Hungary.
2000 – 2006	Chairman of the committee for Raising Public Awareness of Mathematics appointed by the European Mathematical Society.
2000	Moderator of Round Table on Raising Public Awareness of Mathematics at the 3rd European Congress of Mathematics, Barcelona, Spain.
2004	Main organizer of "Circus Mathematicus" for the general public at the 10th International Congress on Mathematical Education, Copenhagen, Denmark.

Research fields in mathematics:
Algebraic and Differential Topology,
Differential Geometry,
Global Analysis.

Other interests in mathematics:
Popularization of Mathematics,
Mathematical Education,
Didactics of Mathematics,
History of Mathematics.

Selected invited lectures:

Conference on "Braids", Santa Cruz, USA, July 1986.

Conference on "Groups of Self-Homotopy Equivalences and Related Topics",
Montreal, Canada, August 1988.

Invited lecture at the 20th Scandinavian Congress of Mathematics,
Trondheim, Norway, August 1988.

"Colloquium on Topology", Pécs, Hungary, July 1989.

Annual lecture at the Technical University of Denmark, May 1993.

Opening lecture at the 15th Nordic Congress of Secondary School Teachers
(Mathematics, Physics, Chemistry), Aarhus, Denmark, July 1993.

One of three main speakers at the first Dutch annual meeting of
secondary school teachers of Mathematics ("Nationale Wiskunde Dagen"),
Noordwijkerhout, Netherlands, February 1995.

Conference on "Perspectives on the teaching of geometry for the 21st century",
Catania, Italy, September 1995.

Invited lecture at the International Congress of Mathematicians,
Beijing, China, August 2002.

Invited lecture at the workshop "Calculus of Variations",
The University of Warwick, Coventry, UK, May 2003.

Opening lecture at the seminar "Framtidens matematikkundervisning", an event
in conjunction with the presentation of the first Abel prize, arranged by the
Royal Norwegian Embassy in Copenhagen, Denmark, October 2003.

Plenary speaker at the Nordic conference "Popularisering av matematikk",
Trondheim, Norway, November 2003.

Invited regular lecture at the 10th International Congress on
Mathematical Education, Copenhagen, Denmark, July 2004.

Laudatio for the Abel Prize winner Mikhael Gromov, lecture at the
Announcement of the Abel Prize for 2009 in Oslo, Norway, March 26, 2009.
Recorded at: http://media01.smartcom.no/Microsite/webcast.aspx?eventid=4117 .

Opening lecture "Rundt om uendeligheden" in connection with the inauguration of
"Danskernes Akademi" on Danish Television DR2, January 11, 2010.
Recorded at: http://www.dr.dk/DR2/Danskernes+akademi/ .

PUBLICATIONS

Vagn Lundsgaard Hansen

Dissertation:

1. "Contributions to the Homotopy Theory of Mapping Spaces," Doctoral dissertation, University of Warwick, March 1972, 135 pages.

Books:

2. "Braids and Coverings -Selected topics," Cambridge University Press, 1989, 199 pages.

3. "Den geometriske dimension - Fra iagttagelse til forskning," Nyt Nordisk Forlag Arnold Busck A/S, 1989, 191 pages.

4. "Temaer fra Geometrien," Matematiklærerforeningen, 1992, 86 pages.

5. "Geometry in Nature," A K Peters, Ltd., Wellesley, Massachusetts, USA, 1993, 248 pages.

   English edition of "Den geometriske dimension."

   Japanese edition published by Toppan Company, Ltd., Tokyo, 1994.

6. "Shadows of the Circle: Conic Sections, Optimal Figures and Non-Euclidean Geometry," World Scientific, Singapore, 1998, 120 pages.

7. "Fundamental Concepts in Modern Analysis," World Scientific, Singapore, 1999, 248 pages.

8. (with P.G. Hjorth and U. Timm) "Matematik og Modellering med Matematik," Gyldendal Uddannelse, 2000, 125 pages.

9. "Matematikkens Uendelige Univers," Den Private Ingeniørfond, 2002, 128 pages.

10. "Functional Analysis: Entering Hilbert Space," World Scientific, Singapore, 2006, 148 pages.

11. "Functional Analysis: Entering Hilbert Space" (Second Edition), World Scientific, Singapore, 2016, 192 pages.

12. "Fundamental Concepts in Modern Analysis: An Introduction to Nonlinear Analysis" (Second Edition), World Scientific, Singapore, 2020, 304 pages.

13. "Shadows of the Circle: From Conic Sections to Planetary Motion" (Second Edition), World Scientific, Singapore, 2024, 224 pages.

Chapters in Books:

14. *Jakob Nielsen and his Contributions to Topology*, Chapter 37 in "History of Topology" (ed. I.M.James), Elsevier Science B.V., 1999, 979–989.

15. *Retfærdighed på formel*, i "Retfærdighedens mange ansigter" (red. Ditlev Tamm), Nyt Nordisk Forlag Arnold Busck A/S, 2003, 195–206.

16. *Matematik og videnskab*, i "Videnskabens Ansigter" (red. Lars Aagaard og Steen Brock), Forlaget Philosophia, 2004, 264–275.

17. *Matematik igennem Millennier*, fire kapitler i "Matematiske Horisonter", Inspirationsbog for Matematik i Gymnasiet udgivet af DTU Informatik og DTU Matematik, 2009, 8–21, 36–49, 88–103, 154–161.

18. *Matematikkens historie*, tema i syv kapitler på "Danmarks Nationale Forskningsportal", [`http://videnskab.dk/`], 2009.

19. *Keeping Mathematical Awareness Alive*, in "Raising Public Awareness of Mathematics" (eds. E.Behrends, N.Crato and J.F.Rodrigues), Springer, 2012, 387–396.

Edited books:

20. "Collected Mathematical Papers of Jakob Nielsen," Birkhäuser Verlag, 1986;
Vol. I, 472 pages; Vol. II, 432 pages.

21. "Differential Geometry," Proceedings of the Nordic Summer School, Lyngby 1985. Lecture Notes in Mathematics **1263**, Springer-Verlag, 1987, 288 pages.

22. (with J.J. Gray) "History of Mathematics," Theme on "History of Mathematics" in *Encyclopedia of Life Support Systems* (EOLSS), developed under the auspices of the UNESCO, Volume 1 (396 pages), 2010. Eolss Publishers, Oxford, UK, [ISBN: 978-1-84826-221-8 (eBook), `http://www.eolss.net/ebooklib/`].

Textbooks:

23. "Forelæsninger over Differentialgeometri og Differentialtopologi (Lectures on Differential Geometry and Topology)," University of Aarhus, 1968, 430 pages.

24. "Grundbegreber i den Moderne Analyse (Fundamental Concepts in Modern Analysis)," The Technical University of Denmark, 1986, 228 pages.
4th ed. (minor changes) 1995.

25. (with P.W. Karlsson) "Matematisk Analyse 2 (Functions of Several Real Variables)," The Technical University of Denmark, 1993, 238 pages.
4th ed. (revised) 1998, 247 pages.

26. "Mathematics 3: Entrance to Advanced Mathematics - The metric foundations of modern analysis," The Technical University of Denmark, 2008, 147 pages.

Invited contributions to special publications:

27. *Everlasting geometry*, in "Perspectives on the teaching of geometry for the 21st century," An ICMI Study (eds. C. Mammana and V. Villani), Kluwer Academic Publishers, 1998, 9–18.

    Spanish edition: *Geometria Eterna*, http://www.xtec.es/ jdomen28/article6.htm .

28. *Popularizing Mathematics: From Eight to Infinity*, in "Proceedings of the International Congress of Mathematicians, Beijing 2002" (ed. LI Tatsien), Higher Education Press, China, 2002, Vol. III, 885–895.(arxiv:math/0305019)

    Reprinted (with illustrations) in Newsletter of the European Mathematical Society, Issue 48, June 2003, 7-11.

    In continuation of *Interview with Vagn Lundsgaard Hansen* (by Bodil Branner and Steen Markvorsen), Newsletter of the European Mathematical Society, Issue 47, March 2003, 15–19.

29. *The dual nature of mathematics*, in "Proceedings of the 10th International Congress on Mathematical Education, Copenhagen, 2004", Book and CD with Regular Lectures (ed. M. Niss), Roskilde University, Denmark, July 2008.
[The article (regular lecture) is available at `http://www.icme10.dk/proceedings/`].

30. *Mathematics through Millenia*, Theme on "Mathematics: History, Concepts, and Foundations" (edited by H.Araki) in *Encyclopedia of Life Support Systems* (EOLSS), developed under the auspices of the UNESCO.
Eolss Publishers, Oxford, UK, [`http://www.eolss.net`], 2005.

    German edition: *Mathematik durch die Jahrtausende*, Internetseite der Deutschen Mathematiker-Vereinigung, [`http://www.mathematik.de`], 2006.

31. *Mathematics Alive and in Action*, Theme on "Mathematics: History, Concepts, and Foundations" (edited by H.Araki) in *Encyclopedia of Life Support Systems* (EOLSS), developed under the auspices of the UNESCO.
Eolss Publishers, Oxford, UK, [`http://www.eolss.net`], 2005.

    German edition: *Mathematik der Gegenwart*, Internetseite der Deutschen Mathematiker-Vereinigung, [`http://www.mathematik.de`], 2006.

32. *The Mathematics of Mikhael Gromov*, presentation of the work of the prizewinner of the Abel Prize for 2009. Homepage of the Abel Prize (http://www.abelprisen.no/en/).
[http://www.abelprisen.no/en/prisvinnere/2009/hansen/], 2009.

Topology, Geometry, Algebra and Global Analysis (Research papers):

33. *On mapping spaces with infinite dimensional target*, Proceedings Advanced Study Institute, University of Aarhus 1970, Vol. I, 154–169.

34. *Some theorems on direct limits of expanding sequences of manifolds*, Math. Scand. **29** (1971), 5–36.

35. *On the homotopy type of certain spaces of differentiable maps*, Math. Scand. **30** (1972), 75–87.

36. *Integrably parallelizable manifolds*, Proc. Amer. Math. Soc. **35** (1972), 543–546.

37. *The homotopy problem for the components in the space of maps on the n-sphere*, Quart. J. Math., Oxford (2) **25** (1974), 313–321.

38. *Equivalence of evaluation fibrations*, Inventiones Math. **23** (1974), 163–171.

39. *On the fundamental group of a mapping space. An example*, Compositio Math. **28** (1974), 33–36.

40. *On the space of maps of a closed surface into the 2-sphere*, Math. Scand. **35** (1974), 149–158.

41. *On a theorem of Al'ber on spaces of maps*, J. Differential Geometry **12** (1977), 565–566.

42. *Decomposability of evaluation fibrations and the brace product operation of James*, Compositio Math. **35** (1977), 83–89.

43. *The homotopy type of the space of maps of a homology 3-sphere into the 2-sphere*, Pacific J. Math. **76** (1978), 43–49.

44. *Embedding finite covering spaces into trivial bundles*, Math. Ann. **236** (1978), 239–243.

45. *Polynomial covering spaces and homomorphisms into the braid groups*, Pacific J. Math. **81** (1979), 399–410.

46. *Coverings defined by Weierstrass polynomials*, J. Reine Angew. Math. **314** (1980), 29–39.

47. *On spaces of maps of n-manifolds into the n-sphere*, Trans. Amer. Math. Soc. **265** (1981), 273–281.

48. *Spaces of maps into Eilenberg - MacLane spaces*, Canadian J. Math. **33** (1981), 782–785.

49. (with K. Grove) *Integrability of G-structures and flat manifolds*, J. Differential Geometry **16** (1981), 117–124.

50. *Local triviality of fiber maps and mapping space constructions*, Topology and its Applications **14** (1982), 263–265.

51. (with J.M. Møller) *On the existence of equivariant embeddings of principal bundles into vector bundles*, Proc. Amer. Math. Soc.**88** (1983), 157–161.

52. *The homotopy groups of a space of maps between oriented closed surfaces*, Bull. London Math. Soc. **15** (1983), 360–364.

53. *On the homotopy groups of punctured manifolds*, Houston J. Math. **10** (1984), 181–186.

54. *Algebra and topology of Weierstrass polynomials*, Expositiones Mathematicae **5** (1987), 267–274.

55. *A model for embedding finite coverings defined by principal bundles into bundles of manifolds*, Topology and its Applications **28** (1988), 1–9.

56. *On Steenrod bundles and the van Kampen theorem*, Canadian Math. Bull. **31** (1988), 241–249.

57. *Polynomial covering maps*, in "Braids" (eds. J.S.Birman and A.Libgober), Amer. Math. Soc., Contemporary Mathematics **78** (1988), 229–243.

58. *The characteristic algebra of a polynomial covering map*, Math. Scand. **64** (1989), 219–225.

59. *Minima for elastics on rigid cylinders*, SIAM Review **31** (1989), 310–317.

60. *The space of self maps on the 2-sphere*, in "Groups of Self-Homotopy Equivalences and Related Topics" (ed. R.A.Piccinini), Springer-Verlag, Lecture Notes in Mathematics **1425** (1990), 40–47.

61. (with P. Petersen,V.) *Groups, coverings and Galois theory*, Canadian J.Math. **43** (1991), 1281–1293.

62. *Topological aspects of Galois theory for function rings*, in "Colloquium on Topology, Pécs, Hungary, 1989," Colloquia Mathematica Societatis János Bolyai **55** (1993), 289–300.

63. *Covering maps with separators*, Topology and its Applications **49** (1993), 221–230.

64. *Weierstrass polynomials for links*, Beiträge zur Algebra und Geometrie **39** (1998), 359–365.

65. *Branched polynomial covering maps*, Topology and its Applications **125** (2002), 63 – 72.

66. (with L. Andersen) *Matematik i en Nautilusskal*, Nordisk Matematisk Tidskrift **53** (2005), No. 3, 130–138.

67. (with A. Aabrandt, B. Poulsen and C. Træholt) *Ranking Entities in Networks via Lefschetz Duality*, in "Proceedings of 2014 UKSim-AMSS: 8th European Modelling Symposium", IEEE Digital Library, doi: 10.1109/EMS.2014.17.

68. (with A. Aabrandt and C. Træholt) *Topological Rankings in Communication Networks*, International Journal of Simulation: Systems, Science and Technology **16**, No. 1 (2015), 57–63.

69. (with A. Aabrandt) *A Note on Powers in Finite Fields*, International Journal of Mathematical Education in Science and Technology **47** (2016), No. 6, 987–991. (Preprint in arxiv:1510.06243)

70. (with A. Aabrandt) *The circle equation over finite fields*, Quaestiones Mathematicae **41**, No. 5 (2018), 665–674.

Research notes:

71. *Stokes' theorem and vector fields on spheres*, University of Aarhus 1968/69. 8 pages.

72. *Qualitative properties of the higher homotopy groups of a space of sections*, Københavns Universitet 1974. 7 pages.

73. *Geometry of Weierstrass polynomials*, Summer Seminar on Complex Analysis, International Centre for Theoretical Physics, Trieste, Italy, 7-31 July 1980. 22 pages.

History and Appreciation of Mathematics (Research/Exposition):

74. *Fra geometri til topologi*, Nordisk Matematisk Tidskrift **36** (1988), 48–60.

75. *Geometrien og den fysiske verden*, Naturens Verden, Årgang 1991, 22–27.

76. *Geometrien og den fysiske verden*, Nordisk Matematisk Tidskrift **39** (1991), 105–117.

77. *Om Jakob Nielsen (1890–1959)*, Nordisk Matematisk Tidskrift **40** (1992), 63–74.

78. *Jakob Nielsen (1890–1959)*, The Mathematical Intelligencer **15** (1993), No.4, 44–53.

79. *Fra figur til form*, Kongresberetning fra den "15. Nordiske LMFK-kongres," Århus Universitet 28.- 31. juli 1993, udgivet af LMFK i Danmark 1994, 12–34.

80. *The magic world of geometry – I. The isoperimetric problem*, Elemente der Mathematik **49** (1994), 61–65.

81. *The magic world of geometry – II. Geometry and algebra of braids*, Elemente der Mathematik **49** (1994), 104–110.

82. *The magic world of geometry – III. The Dirac string problem*, Elemente der Mathematik **49** (1994), 149–154.

83. *The story of a shopping bag*, The Mathematical Intelligencer **19** (1997), No.2, 50–52.

84. *On the Notion of Space in Geometry*, Zentralblatt für Didaktik der Mathematik **30** (1998), No.3, 95–99.

85. *From Figure to Form*, Math Horizons **7** (1999), November 1999, 8–11.

86. *Fascinationen ved knuder*, Aktuel Naturvidenskab, Nr. 2, 2. Årgang, 2000, 12–14.

87. *The Fascination of Knots. The Gordian Knot*, Mathematics Today **36** (2000), August 2000, 127–128.

88. (author and editor) *How to increase public awareness of mathematics*, in "Mathematical Glimpses into the 21st Century" (eds. C. Casacuberta, R.M. Miró-Roig, J.M. Ortega, S. Xambó-Descamps), Proceedings of 3rd European Congress of Mathematics, Societat Catalana de Matemàtiques, Barcelona, Spain, 2002, 55–81.

89. *Tanker omkring billedet 'Udlængsel'*, i "Spiralnætter" (red. Anne Marie Karnov). Omkring Michael Gregaards billeddigtkreds "Nattens Salt - Spiral Nights", Husets Forlag, 2002, 89–90.

90. *Rundt om uendeligheten*, Konferanserapport fra den nordiske konferanse i matematikkdidaktikk "Popularisering av matematikk," Trondheim, 17.-18. november 2003. Skriftserie for Nasjonalt Senter for Matematikk i Opplæringen, Trondheim, Norge, No 2, 2004, 81–92.

91. *Rundt om uendeligheden*, Nordisk Matematisk Tidskrift **52** (2004), Nr. 3, 105–117.

92. *Med ånden i hånden*, Håndarbejde i Skolen, Nr. 4 - 2010, 43–47. Publikation fra Danmarks Håndarbejdslærerforening, 2010.

93. (with P.G. Hjorth) *Tal og geometri på date - giver Abelpris til Tate*, Aktuel Naturvidenskab, Nr. 6, 2010, 40–42.

94. (with P.G. Hjorth) *Eksotiske strukturer i syv dimensioner - gav Abelpris til Milnor på seks millioner*, Aktuel Naturvidenskab, Nr. 6, 2011, 36–39.

95. (with P.G. Hjorth) *Abelpris til informatikkens teoretiske stjerne: Kombinatorik i en klarsysnet hjerne*, Aktuel Naturvidenskab, Nr. 6, 2012, 12–15.

96. *Hyldest til den gode forklaring*, MATEMATIK, Nr. 1 - 2013, 24–27. Tidsskrift udgivet af Danmarks Matematiklærerforening, 2013.

97. (with B. Toft) *The Danish Mathematical Society Turns 140*, Newsletter of the European Mathematical Society, Issue 88, June 2013, 57–58.

98. (with P.G. Hjorth) *Abelpris til Pierre Deligne for banebrydende matematisk rapsodi om de algebraiske ligningers geometri*, Aktuel Naturvidenskab, Nr. 6, 2013, 47–49.

99. (with P.G. Hjorth) *På dynamikken fik han skik - og Abelprisen til Sinai gik*, Aktuel Naturvidenskab, Nr. 5, 2014, 15–17.

Mathematical Education (Research/Exposition):

100. *Diracs strengproblem*, Elementa **66** (1983), 192–203.

101. *Optimale plane figurer*, Kapitel 9 i bogen "Midt i Matematikken" (red. G. Fosgerau og F.H. Kristiansen), udgivet af tidsskriftet KVAN, Århus Dag- og Aftenseminarium, 1992. 2. reviderede udgave i samarbejde med Matematiklærerforeningen, 1996.

102. *Den geometriske omverden*, i "Matematiske Ideer" (red. S.T. Jensen og J. Matthiasen), Matematiklærerforeningen, 1993, 59–69.

103. *Ikke-euklidisk geometri i støbeskeen*, i "Matematiske Essays" (red. J. Carstensen og S.T. Jensen), Matematiklærerforeningen, 1995, 47–73.

104. *I am the greatest*, Mathematics in School **25** (1996), No. 4, 10–11.

105. *Jeg er den største*, Nordisk Matematisk Tidskrift **46**(1998), 71–75.

106. *Un conte de fées mathématique*, in "Mathématiques Buissonnières" (direction Jean-Michel Kantor), Ministère de l'Éducation Nationale et Ministère de la Recherche, France, Édition Vuibert, Paris, 2000, 11–13.

107. *The dawn of non-euclidean geometry*, International Journal of Mathematical Education in Science and Technology **28** (1997), No. 1, 3–23.

Didactics of Mathematics (Research/Exposition):

108. *Efter Morris Kline - Hva' så eller Hva' nu?*, Bidrag til en samling af essays "Den ny Matematik i Danmark." Gyldendal 1979, 36–40.

109. *Relations between pure and applied mathematics in engineering education*, Proc. "7th Nordic Conference on Teaching of Mathematics at Technical Universities," Aalborg University Center, 19.-21. August 1987, 55-58.

110. *Ren og anvendt matematik i de videregående teknisk - naturvidenskabelige uddannelser*, Rapport fra Statens Humanistiske Forskningsråds konference "Matematikundervisning i dens betydning for en demokratisk enhedskultur under højteknologien," Gilleleje, 11.-12. maj 1987. Aarhus Universitetsforlag 1988, 54-59.

111. *Krav og forventninger til gymnasiets matematikundervisning, set fra DTU*, Rapport fra Statens Humanistiske Forskningsråds konference "Gymnasiets matematikundervisning mellem studie- og erhvervskrav og demokratikrav," Gilleleje, 23.-25. november 1988. IMFUFA, Roskilde Universitetscenter 1989, 21-27.

112. *Perspectives on the teaching of geometry for the 21st century*, Discussion document for an ICMI Study. Document prepared for the International Commission on Mathematical Instruction by V. Villani, C. Mammana, R. Douady, V.L. Hansen, R. Hershkowitz, J. Malkevitch, I. Osta, M. Niss, L'enseignement Mathématique **40** (1994), No. 3–4, 345–357.

113. *Everlasting geometry*, Pre–proceedings for Catania conference 28 September - 2 October 1995 (ed. C. Mammana) to prepare an ICMI Study, Department of Mathematics, University of Catania, 1995, 94–97.

114. *Skolens undervisning i matematik og naturvidenskabelige fag og videnskabsfagene*, Forskningsberetning fra Danmarks Lærerhøjskole 1995, 18–24.

115. (with P.G. Hjorth and S. Markvorsen) *Matematik mellem menneske og maskine*, i "Matematikundervisning i lyset og skyggen af edb" (red. G. Fosgerau, H.N. Jensen og H.S. Pedersen), udgivet af tidsskriftet KVAN, Århus Dag- og Aftenseminarium, 1996, 71–82.

116. (author and editor) *Changes and trends in geometry curricula*, Chapter 7 in "Perspectives on the teaching of geometry for the 21st century," An ICMI Study (eds. C. Mammana and V. Villani), Kluwer Academic Publishers, 1998, 235–261.

117. (author and editor) *Education: Challenges for mathematics*, Proceedings of 2nd European Congress of Mathematics, Volume II, Progress in Mathematics **169**, Birkhäuser Verlag, 1998, 380–402.

118. *Om forskningsbegreber i matematik og matematikkens didaktik*, Rapport fra konferencen "Matematikundervisningens praksis og matematikdidaktisk forskning - hvordan spiller de sammen?", Nyborg, 18.-19. januar 2000. Udgivet i Skriftserie fra Center for forskning i Matematiklæring (ISSN nr. 1600-2474), januar 2001, 7–14.

119. *Education in Mathematics - Mathematics in Education*, Invited contribution to "Thematic Afternoon on Mathematics and Mathematics Education" at the 10th International Congress on Mathematical Education, Copenhagen, 2004, `http://www.icme-organisers.dk/taC/mathandmathed.pdf`.

    See also report from Thematic Afternoon C in "Proceedings of the 10th International Congress on Mathematical Education" (ed. M. Niss), Roskilde University, Denmark, July 2008. [Report available at `http://www.icme10.dk/proceedings/`].

Elementary papers:

120. *Hvad er de 7 elementære katastrofer i rum - tid for noget?*, GAMMA (Tidsskrift for Fysik)**42** (1980), 20–27.

121. *Nogle geometriske variationsproblemer*, LMFK-bladet (Medlemsblad for Gymnasie-skolernes Lærerforeninger i Matematik, Fysik og Kemi), Nr.1, 1991, 13–21.

Lecture notes (selected):

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Editor of Cogent Mathematics & Statistisc, Taylor & Francis Group, UK.
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