

Curriculum Vitae: Olav Geil

Last update: April 6, 2018

Personal information

Date of birth April 7, 1962
Position Vice Dean for Education
Affiliation The Faculty of Engineering and Science
Aalborg University
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Academic degrees

PhD in Mathematics, Aalborg University, May 17th, 2000.
MSc in Mathematics and Physics, Aalborg University, June 26th, 1996.

Employment

2018– Vice Dean for Education, The Faculty of Engineering and Science, Aalborg University
2014– Professor with Special Responsibilities, Dept. of Math. Sci., Aalborg University
2002–2014 Associate Professor, Dept. of Math. Sci., Aalborg University
1999–2002 Assistant Professor, Dept. of Math. Sci., Aalborg University

Research stays

University of Zürich, Switzerland, 2018 (2 days). / Jaume I University, Castellon, Spain, 2016 (two weeks). / East China Normal University, Shanghai, China, 2013 (ten days). / Basel University, Basel, Switzerland, 2012 (one week). / East China Normal University, Shanghai, China, 2012 (ten days). / Tokyo Institute of Technology, 2006 (two weeks). / Technical University of Denmark, Lyngby, Denmark, 2000 (2 weeks). / Eindhoven University of Technology, Eindhoven, The Netherlands, 1998 (3 months). /

Grants

Grant holder and principal investigator for research project under DFF-FNU, “How secret is a secret?”, DFF-4002-00367, 2014–2017, (2.509.920 DKK.)

The Villum Foundation for Ryutaroh Matsumoto as Velux Visiting Professor, 2014, (201.300 DKK).

The Villum Foundation for Ryutaroh Matsumoto as Velux Visiting Professor, 2011, (285.000 DKK).

Management

Principal investigator for research project “How secret is a secret?”, 7 scientists, 2014–2017.

Chairman for the 1st year mathematics studies development project first.math, 2012–2016, (annual budget 7.500.000 DKK).

Participation in “Research Management Course”, Copenhagen Business School, 2016.

Publications

Orcid: 53 papers <http://orcid.org/0000-0002-9666-3399>
ResearcherID: 46 papers <http://www.researcherid.com/rid/F-4662-2011>
Scopus: 35 papers <https://www.scopus.com/authid/detail.uri?authorId=6602737792>

Citations

Google Scholar: 583 citations h-index 13 <https://scholar.google.dk/citations?user...>
ResearcherID: 216 citations h-index 9
Scopus: 252 citations h-index 10

Referee/Reviewer

Finite Fields and Their Applications; Designs, Codes and Cryptography; IEEE Transactions on Information Theory; Discrete Mathematics; Advances in Mathematics of Communications; Communications of the Korean Mathematical Society; Journal of Pure and Applied Algebra; Cryptography and Communications; Applicable Algebra in Engineering, Communication and Computing; Journal of Symbolic Computation; Mathematical Review/MathSciNet; various workshops and conferences

Talks

Invited: 29 Contributed: 13 (full list at the end of the document)

Organization of conferences/workshops

Dune workshop on secrets, Klitgaarden Skagen, October 2–4, 2017.

“Secrets”, Technical University of Denmark, November 14, 2016.

“Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory”, Aalborg University, June 30, 2014.

In collaboration with D. Ruano “4th AGINCC Workshop”, Skagen, Denmark, July 28–31, 2013.

In collaboration with T. Høholdt, Session “Coding Theory” at “European Mathematical Society Joint Mathematical Weekend”, University of Copenhagen, March 2, 2008.

“Mini Workshop on Error Correcting Codes and Network Coding”, Aalborg University, September 19, 2007.

In collaboration with L. D. Andersen, “8th Nordic Combinatorial Conference”, Aalborg University, October 20–22, 2004.

Program Committee Member

5th International Caste Meeting on Coding Theory and Applications (ICMCTA) 2017 / International Symposium on Network Coding (NetCod) 2014 / Workshop on Coding and Cryptography (WCC) 2013 / / Workshop on the Arithmetic of Finite Fields (WAIFI) 2012 / International Workshop on the Arithmetic of Finite Fields (WAIFI) 2010

Long-term guests

F. Hernando, Jaume I University, Spain, 2017 (1 month). / F. Özbudak, Middle East Technical University, Turkey, 2016 (1 month). / R. Pellikaan, Eindhoven University of Technology, The Netherlands, 2016 (2 weeks). / F. Hernando, Jaume I University, Spain, 2015 (1 month). / R. Pellikaan, Eindhoven University of Technology, The Netherlands, 2015 (2 weeks). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2014 (3 months). / F. Hernando, Jaume I University, Spain, 2013 (1 month). / Y. Luo, Shanghai Jiao Tong University, China, 2013 (1 month). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2011 (4.5 months). / C. Galindo, Jaume I University, Spain, 2010 (1 month). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2006 (2 weeks) / M. Sala, University of Trento, Italy, 2006 (1 month). /

PhD students

Emircan Çelik (co-supervisor 2017–)

Umberto Martínez Peñas (2014–)

Stefano Martin (2011–2014)

Casper Thomsen (2007–2011)

Henning E. Andersen (informal co-supervisor 2002–2005)

Master students

Kasper Halbak Christensen (2017) / Louise Foshammer (2014) / Malte Neve-Græsbøl (2014) / Henning Thomsen (2012) / Maria Simonsen (2012) / Majken Svendsen (2012) / Claus Jensby Madsen (2010) / Thomas H. Skjærbæk (2010) / Nicola Machetti (2010) / Elisabeth Kuhr Rasmussen (2005) / Maria Sondrup Iversen (2004) / Jane Gravgård Knudsen (2004) / Henning E. Andersen (2001)

PhD courses given at foreign universities

5 hours course at “International School and Conference on Coding Theory”, CIMAT, Guanajuato, Mexico, November 28 – December 4, 2008.

In cooperation with Massimiliano Sala, “Summer Doctoral School 2009, Gröbner Bases, Geometric Codes and Order Domains”, University of Trento, June 8–13, 2009.

6 hours course at “Soria Summer School on Computational Mathematics”, University of Valladolid, July 12–16, 2010.

Participation in PhD committees

University of Trento (1 student). / Technical University of Denmark (chairman of 4 committees).

Teaching

PhD supervision course, AAU Learning Lab, 2015. / Teaching training course “Adjunkt-pædagogikum”, Pdagogisk Udviklingscenter, AAU, 2001–2002. / Since 1999 teaching at all levels from bachelor to PhD.

Current project participation

I am part of the project SECURE (Secure Estimation and Control Using Recursion and Encryption). This is a major Aalborg University interdisciplinary research project headed by Principal Investigator Rafael Wisniewski and running in the three years 2018-2020. The members are: Rafael Wisniewski, Tom N. Jensen, Mads G. Christensen, Maja H. Bruun, Astrid O. Andersen, Ignacio Cascudo and Olav Geil.

Publication list

Journal publications and articles in books

1. O. Geil, F. Özbudak, “On affine variety codes from the Klein quartic,” to appear in *Cryptography and Communications*
2. C. Galindo, O. Geil, F. Hernando, D. Ruano, “Improved constructions of nested code pairs,” accepted for publication in *IEEE, Trans. Inform. Theory*, available from <https://arxiv.org/abs/1610.06363>, 2017, DOI: 10.1109/TIT.2017.2755682.
3. O. Geil, S. Martin, U. Martínez-Peñas, R. Matsumoto, D. Ruano, “On asymptotically good ramp secret sharing schemes,” *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, vol. E100-A, no. 12, 2017, pp. 2699–2708.
4. O. Geil, S. Martin, “Relative generalized Hamming weights of q -ary Reed-Muller codes,” *Adv. Math. Commun.*, vol. 11, No. 3, 2017, pp. 503–531.
5. O. Geil, F. Özbudak, “Bounding the minimum distance of affine variety codes using symbolic computations of footprints,” Proceedings of 5th International Castle Meeting, ICMCTA 2017, *Lecture Notes in Comput. Sci.*, vol. 10495, 2017, pp. 128–138.
6. O. Geil, D. Lucani, “Random network coding over composite fields,” Proceedings of 5th International Castle Meeting, ICMCTA 2017, *Lecture Notes in Comput. Sci.*, vol. 10495, 2017, pp. 118–127.
7. C. Galindo, O. Geil, F. Hernando, D. Ruano, “On the distance of stabilizer quantum codes from \mathcal{J} -affine variety codes,” *Quantum Inf. Process.*, vol. 16, 2017, 32 pp.
8. O. Geil, C. Thomsen, “More results on the number of zeros of multiplicity at least r ,” *Discrete Math.*, vol. 340, 2017, pp. 1028–1038.
9. O. Geil, S. Martin, U. Martínez-Peñas, D. Ruano, “Refined analysis of RGHWS of code pairs coming from Garcia-Strichtenoth’s second tower,” *J. Algebra Comb. Discrete Struct. Appl.*, vol. 4, 2017, pp. 37–47.

10. R. Matsumoto, Ruano, D. O. Geil, "List decoding algorithm based on voting in Gröbner bases for general one-point AG codes," *J. Symbolic Comput.*, vol. 79, part 2, 2017, pp. 384–410.
11. O. Geil, S. Martin, U. Martínez-Peñas, R. Matsumoto, D. Ruano, "On asymptotically good ramp secret sharing schemes," Proceedings (electronic) of WCC-2015, edited by P. Charpin, 10 pp.
12. O. Geil, "Roots and coefficients of multivariate polynomials over finite fields," *Finite Fields Appl.*, vol. 34, 2015, pp. 36–44.
13. O. Geil, S. Martin, "An improvement of the Feng-Rao bound for primary codes," *Des. Codes Cryptogr.*, vol. 76 (1), 2015, pp. 49–79.
14. O. Geil, S. Martin, R. Matsumoto, D. Ruano, Y. Luo, "Relative generalized Hamming weights of one-point algebraic geometric codes," *IEEE, Trans. Inform. Theory*, vol. 60, 2014, pp. 5938–5949.
15. O. Geil, S. Martin, "Further improvements on the Feng-Rao bound for dual codes," *Finite Fields Appl.*, vol. 30, 2014, pp. 33–48.
16. O. Geil, R. Matsumoto, D. Ruano, "Feng-Rao decoding of primary codes," *Finite Fields Appl.*, vol. 23, 2013, pp. 35–52.
17. R. Matsumoto, D. Ruano, O. Geil, "Generalization of the Lee-O'Sullivan List Decoding for One-Point AG Codes," *J. Symbolic Comput.*, vol. 55, 2013, pp. 1–9.
18. O. Geil, C. Thomsen, "Aspects of random network coding," Book chapter in *Algebraic Geometry Modeling in Information Theory*, World Scientific (Series on Coding Theory and Cryptography, vol. 8), Edited by Edgar Martinez-Moro, 2013, pp. 47–81.
19. O. Geil, C. Thomsen, "Weighted Reed-Muller codes revisited," *Des. Codes Cryptogr.*, vol. 66, (1-3), 2013, pp. 195–220.
20. O. Geil, R. Matsumoto, D. Ruano, "List Decoding Algorithms based on Groebner Bases for General One-Point AG Codes," Proceedings of 2012 IEEE International Symposium on Information Theory (*ISIT*), July 1-6, 2012, Boston, MA, USA, pp. 86–90.
21. O. Geil, S. Martin, R. Matsumoto, "A new method for constructing small-bias spaces from Hermitian codes," Proceedings of WAIFI 2012, *Lecture Notes in Comput. Sci.*, vol. 7369, 2012, pp. 29–44.
22. O. Geil, C. Munuera, D. Ruano, F. Torres, "On the order bounds for one-point AG codes," *Adv. Math. Commun.*, 2011, pp. 489–504.
23. O. Geil, C. Thomsen, "List decoding of a class of affine variety codes," Proceedings of WCC-2011, Paris, Ed. by D. Augot and A. Canteaut, pp. 263–272.
24. O. Geil, "Algebraic geometry codes from order domains," Book chapter in *Gröbner Bases, Coding, and Cryptography*, Springer, 2009, Eds.: Sala, Mora, Perret, Sakata, Traverso, pp. 121–141.
25. O. Geil, R. Matsumoto, "Bounding the number of rational places using Weierstrass semigroups," *Journal of Pure and Applied Algebra*, vol. 213, (6), 2009, pp. 1152–1156.

26. O. Geil, "Evaluation Codes from an Affine Variety Code Perspective," Book chapter in *Advances in algebraic geometry codes*, Ser. Coding Theory Cryptol., 5, World Sci. Publ., Hackensack, NJ, 2008, Eds.: E. Martinez-Moro, C. Munuera, D. Ruano, pp. 153–180.
27. O. Geil, R. Matsumoto, C. Thomsen, "On Field Size and Success Probability in Network Coding," Proceedings of WAIFI 2008, *Lecture Notes in Comput. Sci.*, vol. 5130, 2008, pp. 157–173.
28. O. Geil, "On the second weight of generalized Reed-Muller codes," *Des. Codes Cryptogr.*, vol. 48 (3), 2008, pp. 323–330.
29. H. E. Andersen, O. Geil, "Evaluation Codes from Order Domain Theory," *Finite Fields Appl.*, vol. 14 (1), 2008, pp. 92–123.
30. O. Geil, R. Matsumoto, "Generalized Sudan's list decoding for order domain codes," Proceedings of AAECC-17, *Lecture Notes in Comput. Sci.*, vol. 4851, Springer-Verlag, 2007, pp. 50–59.
31. O. Geil, C. Thommesen, "On the Feng-Rao Bound for Generalized Hamming Weights," Proceedings of AAECC-16, *Lecture Notes in Comput. Sci.*, vol. 3857, Springer-Verlag, 2006, pp. 295–306
32. O. Geil, "On Codes from Norm-Trace Curves," *Finite Fields Appl.*, vol. 9, 2003, pp. 351–371.
33. O. Geil, R. Pellikaan, "On the Structure of Order Domains," *Finite Fields Appl.*, vol. 8, 2002, pp. 369–396.
34. O. Geil, T. Høholdt, "On Hyperbolic Codes," Proceedings of AAECC-14, *Lecture Notes in Comput. Sci.*, vol. 2227, Springer-Verlag, 2001, pp. 159–171.
35. O. Geil, T. Høholdt, "Footprints or Generalized Bezout's Theorem," *IEEE Trans. Inform. Theory*, vol. 46, 2000, pp. 635–641.

PhD-thesis

36. O. Geil, "Codes Based on an \mathbb{F}_q -Algebra," Department of Mathematical Sciences, Aalborg University, 2000. Adviser Christian Thommesen.

Preprints

37. C. Galindo, O. Geil, F. Hernando, D. Ruano, "New binary and ternary LDC codes," 2017, 14 pages.
38. O. Geil, U. Martínez-Peñas, "Bounding the number of common zeros of multivariate polynomials and their consecutive derivatives," 2017, 26 pages.
39. O. Geil, F. Özbudak, D. Ruano, "Constructing Sequences with High Nonlinear Complexity from Hermitian Function Fields," 2017, 12 pages.
40. D. E. Lucani, M. V. Pedersen, D. Ruano, C. W. Sørensen, F. H. P. Fitzek, J. Heide, O. Geil, "Fulcrum network codes: a code for fluid allocation of complexity," 2015, 31 pages. Available from <http://arxiv.org/pdf/1404.6620v2.pdf>.

Peer reviewed summaries and extended abstracts

41. O. Geil, S. Martin, “Affine variety codes are better than their reputation,” Proceedings of the 21st Symposium on Mathematical Theory of Networks and Systems, University of Groningen, 2014, pp. 362–365.
42. O. Geil, S. Martin, R. Matsumoto, D. Ruano, Y. Luo, “Relative generalized Hamming weights of one-point algebraic geometric codes,” Proceedings of IEEE Information Theory Workshop (*ITW*), 2014, pp. 137–141.
43. H. E. Andersen, O. Geil, ”The Missing Evaluation Codes from Order Domain Theory,” Proceedings of 2004 IEEE International Symposium on Information Theory (*ISIT*), Chicago, p. 78.
44. O. Geil, T. Høholdt, “On Hyperbolic Type Codes,” Proceedings of 2003 IEEE International Symposium on Information Theory (*ISIT*), Yokohama, p. 331.
45. O. Geil, ”A Class of Groebner Basis Theoretically Based Evaluation Codes,” Proceedings of 2002 IEEE International Symposium on Information Theory (*ISIT*), Lausanne, p. 60.
46. O. Geil, ”Codes from Order Domains,” Proceedings of 2001 IEEE International Symposium on Information Theory (*ISIT*), Washington, p. 308.

Book reviews

47. O. Geil, “Book Review of : Tracey Ho and Desmond S. Lun, Network Coding: An Introduction,” *Computer Journal*, vol. 54, 2009, p. 510.
48. O. Geil, C. Thommesen, “Book review of: Jørn Justesen and Tom Høholdt, A Course In Error-Correcting Codes,” *Newsletter of The European Mathematical Society*, March 2005, pp. 39–40.
49. O. Geil, C. Thommesen, “Book review of: Jørn Justesen and Tom Høholdt, A Course In Error-Correcting Codes,” *Matilde* (newsletter for Dansk Matematisk Forening), vol. 21, 2004, p. 27.

Miscellaneous

50. O. Geil, actor in and screen writer for the film “Olav Geil: Fejlkorrigerende koder.” 10 danske matematikere – 10 matematiske fortællinger, L&R Uddannelse, 2016. Available from <https://www.youtube.com/watch?v=rIszlgH7Exw>.
51. O. Geil, S. Martin, U. Martínez-Peñas, D. Ruano, “Refined analysis of RGHWs of code pairs coming from Garcia-Stichtenoth’s second tower,” Proceedings of *ACA 2015-Applications of Computer Algebra*, Kalamata, Greece 2015, 5 pp. Available from <http://www.singacom.uva.es/~iremarquez/CACTC2015/CACTC-4.pdf>.
52. O. Geil, “Two applications of the footprint (or Δ -set) bound : Estimation of generalized Hamming weights,” by Olav Geil, poster at Special Semester on Gröbner Bases and Related Methods 2006, Workshop D1: Gröbner Bases in Cryptography, Coding

Theory and Algebraic Combinatorics, Radon Institute for Computational and Applied Mathematics and Research Institute for Symbolic Computation, Linz, Austria, May 2006.

53. H. E. Andersen, O. Geil, "On the minimum distance of one-point geometric Goppa codes," in Proceedings of AGCT-10 : Arithmtique et Thorie de L'Information, CIRM, Luminy, 2005, Eds. F. Rodier and S. Vladut, 2005, 2 pp.
54. O. Geil, "On some Gröbner Basis Theoretical Applications," in Proceedings of the 8th Nordic Combinatorial Conference, edited by Lars Døvling Andersen and Olav Geil, Aalborg University 2004, pp. 59-64.
55. L. D. Andersen, O. Geil, editors of "Proceedings of the 8th Nordic Combinatorial Conference," Aalborg University 2004.

Talks and workshops

1. Invited talk

University of Zürich, March 21, 2018,
(presenting joint work with Carlos Galindo, Fernando Hernando and Diego Ruano,
and joint work with René B. Christensen)
Optimized constructions of nested code pairs

2. Contributed talk

5th International Castle Meeting on Coding Theory and Applications,
Vihula, Estonia, August 28-31, 2017
(Presenting joint work with Ferruh Özbudak)
"Bounding the minimum distance of affine variety codes using symbolic computations
of footprints."

3. Contributed talk

5th International Castle Meeting on Coding Theory and Applications,
Vihula, Estonia, August 28-31, 2017
(Presenting joint work with Daniel E. Lucani)
"Random network coding over composite fields."

4. Invited talk

SIAM Conference on Applied Algebraic Geometry
Session MS86: *Coding Theory*.
Georgia Institute of Technology, USA, July 31 - August 4, 2017
(Presenting joint work with Carlos Galindo, Fernando Hernando and Diego Ruano)
"Improved construction of nested code pairs."

5. Invited talk

Meeting of the Catalan, Spanish, Swedish Math Societies

Session 5: *Numerical Semigroups and Applications.*

Umeå University, Sweden, June 12-15, 2017

(Presenting joint work with Kasper Halbach Christensen)

“A Gröbner basis approach for counting rational places in algebraic function fields.”

6. Contributed talk

Secrets

Technical University of Denmark, Lyngby, Denmark, November 14, 2016

“Improved constructions of nested code pairs.”

7. Workshop organization

(in collaboration with Peter Beelen)

Secrets

Technical University of Denmark, Lyngby, Denmark, November 14, 2016.

8. Inaugural Lecture

Department of Mathematical Sciences, Aalborg University, August 30, 2016 “Bounding the number of affine roots – with applications in reliable and secure communication”

9. Invited talk

On the Algebraic and Geometric Classifications of Projective Varieties University of Messina, Italy, June 20–24, 2016

“Bounding the number of affine roots using algebraic methods.”

10. Invited talk

Seminar at Jaume I University, Spain, June 3, 2016

“Bounding the number of affine roots using algebraic methods.”

11. Invited research stay

University Jaume I, Castellon, Spain, May 23 – June 3, 2016

12. Workshop participation

Symposium on the 60th birthday of Ivan Damgård Aarhus University, Denmark, April 1-2, 2016

13. Invited talk

Information Meeting for The Danish National Research Foundation at Aalborg University

Aalborg University, Denmark, February 3, 2016

With Tom Høholdt

“Presentation of Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography”

14. Workshop participation

DARNEC'15 Design and Application of Random Network Codes

Istanbul Technical University, Turkey, November 4–6, 2015

15. Workshop participation

The Seventh International Workshop on Coding and Cryptography (WCC-2015)

Paris, France, April 13–17, 2015.

16. **Contributed talk**
Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory
 Aalborg University, Denmark, June 30, 2014
 (Presenting joint work with Stefano Martin, Ryutaroh Matsumoto, Diego Ruano, and Yuan Luo)
 “Ramp secret sharing schemes from one-point AG codes.”
17. **Workshop organization**
Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory
 Aalborg University, Denmark, June 30, 2014.
18. **Contributed talk**
IEEE Information Theory Workshop (ITW 2014)
 Hobart, Tasmania, Australia, November 2–5, 2014
 (presentation of joint work with Stefano Martin, Ryutaroh Matsumoto, Diego Ruano and Yuan Luo)
 “Relative generalized Hamming weights of one-point algebraic geometric codes.”
19. **Workshop participation**
4th International Castle Meeting on Coding Theory and Applications
 Castle of Palmela, Portugal, September 14–20, 2014
20. **Workshop participation**
NetCod 2014 – International Symposium on Network Coding
 Aalborg University, Denmark, June 27–28. 2014
21. **Invited talk**
International Conference on Algebraic Geometry and Coding Theory
 Indian Institute of Technology, Bombay, Mumbai, India
 December 2–6, 2013
 “Affine variety codes are better than their reputation.”
22. **Invited talk**
Special Semester on Applications of Algebra and Number Theory
Algebraic Curves over Finite Fields
 RICAM, Linz, Austria, November 11–15, 2013
 “Affine variety codes are better than their reputation.”
23. **Workshop participation**
COST Conference
 Ghent University, Belgium, September 18–20 2013
24. **Workshop organization**
 (in collaboration with Diego Ruano)
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 Klitgården, Skagen, Denmark, July 28–31 2013
25. **Invited research stay**
 East China Normal University, Shanghai, China, April ??–?? 2013

26. **Invited talk**
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 East China Normal University, Shanghai, China, April ??–?? 2013
 “The Feng-Rao bounds for RGHW with applications in Secret Sharing”
27. **Invited talk**
Zürich COST Meeting
 University of Zürich, Switzerland, June 20–21, 2013
 “On Success Probability in Random Network Coding (A review).”
28. **Invited talk**
Mathematics of Information-Theoretic Cryptography
 Lorenz Center, Leiden, The Netherlands, May 21–25 , 2013
 “Further improvements on the Feng-Rao bound for dual codes.”
29. **Invited talk**
KIAS International Conference on Coding Theory and Applications
 KIAS, Seoul, Korea, November 15–17, 2012
 “The Feng-Rao bounds.”
30. **Workshop participation**
Trends in Coding Theory
 Ascona, Switzerland, October 28 – November 2, 2012
31. **Invited talk**
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 Technical University of Denmark, August 15–16 2012
 (presentaion of joint work with Ryutaroh Matsumoto and Diego Ruano)
 “Feng-Rao decoding of primary codes.”
32. **Invited talk**
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 East China Normal University, May 19–26 2012
 “One-point AG-codes from an affine-variety point of view.”
33. **Invited research stay**
 East China Normal University, Shanghai, China, May 19–26 , 2012.
34. **Invited talk**
 Basel University, Switzerland, March 19, 2012
 “ n applications of the footprint bound ($n \geq 3$).”
35. **Invited research stay**
 Basel University, Switzerland
 March 16 – 23, 2012.
36. **Invited talk**
Combinatorial, Algebraic and Algorithmic Aspects of Coding Theory
Aspects of Coding Theory
 EPFL, Lausanne, Switzerland, July 25, 2011

- (Presenting joint with Casper Thomsen)
 “Weighted Reed-Muller codes revisited.”
37. **Workshop participation**
The Seventh International Workshop on Coding and Cryptography (WCC-2011)
 Paris, France, April 11–15, 2011.
 38. **Invited lectures**
3rd Soria Summer School in Computational Mathematics
 Soria, Spain
 July 12–16, 2010 Six hours lecture “Network Coding.”
 39. **Workshop participation**
12th IMA International Conference on Cryptography and Coding
 Cirencester, England, December 15–17, 2009
 40. **Invited workshop participation**
Workshop on Sequences, Codes and Curves
 Antalya, Turkey, September 25–29, 2009
 41. **Workshop participation**
NetCod 2009 – International Symposium on Network Coding
 EPFL, Lausanne, Switzerland, June 15–16 2009
 42. **PhD school organization and lectures**
 (in collaboration with Max Sala)
 Summer Doctoral School: *Gröbner Bases, Geometric Codes, and Order Domains*
 University of Trento, Italy, June 8–13, 2009
 43. **Invited talk**
4th Interdisciplinary Seminar on Applied Mathematics Aalborg University, Denmark,
 April 23, 2009
 “Random Network Coding and Error-Erasure Correction in Networks”
 44. **Invited lectures**
International School and Conference on Coding Theory
 Centro de Investigación en Matemáticas (CIMAT), Guanajuato, Mexico, November
 28–December 4, 2008
 Five hours lecture: “Order domain codes and affine variety codes.”
 45. **Invited talk**
Applications of Computer Algebra (ACA)
 RISC, Castle of Hagenberg, Austria, July 27–30, 2008
 “On the second weight of generalized Reed-Muller codes.”
 46. **Workshop participation**
International Workshop on the Arithmetic of Finite Fields WAIFI 08
 University of Siena, Italy
 July 6–9, 2008.
 47. **Session organization**
Session: Coding Theory
European Mathematical Society, Joint Mathematical Weekend
 University of Copenhagen, February 29 – March 2, 2008

48. **Invited talk**
Thematic Seminar on Algebraic Geometry, Coding and Computing
 University of Valladolid, Segovia, Spain, October 8–10, 2007
 “Weierstrass semigroups and the number of rational places.”
49. **Contributed talk**
 Mini-workshop *Error-correcting codes and network coding*
 Aalborg University, Denmark, September 19, 2007
 “Weierstrass semigroups and the number of rational places.”
50. **Workshop organization**
 Mini-workshop *Error-correcting codes and network coding*
 Aalborg University, Denmark, September 19, 2007
51. **Invited talk**
2nd Interdisciplinary Seminar on Applied Mathematics
 Aalborg University, Denmark, October 25, 2006
 “Affine Variety Codes”
52. **Workshop participation**
IMA workshop: Complexity, Coding, and Communications
 University of Minnesota, USA, April 16–20, 2007.
53. **Invited talk**
Seminar
 Tokyo Institute of Technology, Japan, August 8, 2006
 “Generalizations of the Reed-Solomon Codes Via Gröbner Basis Theory.”
54. **Invited research stay**
 Tokyo Institute of Technology, Japan, Two weeks, August, 2006
55. **Invited talk**
KIAS-RIMS joint workshop on Computer Algebra
 Kyoto, Japan, July 31 – August 4, 2006
 “Algebraic Geometry Codes in a Pure Gröbner Basis Theoretical Setting.”
56. **Invited poster**
Special Semester on Gröbner Bases and Related Methods 2006
Workshop D1: Gröbner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics
 Radon Institute for Computational and Applied Mathematics
 Linz, Austria, May 1–6, 2006
 “Two applications of the footprint bound – estimation of generalized Hamming weights”
57. **Invited talk**
Special Semester on Gröbner Bases and Related Methods 2006
Workshop D1: Gröbner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics
 Radon Institute for Computational and Applied Mathematics
 Linz, Austria, May 1–6, 2006
 “Order Domain Codes”

58. **Contributed talk**
Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-16)
 Las Vegas, NV, USA, February 20–24, 2006
 (Presenting joint work with Christian Thommesen)
 “On the Feng-Rao bound for generalized Hamming weights”
59. **Invited talk**
Arithmetic, Geometry, Cryptography and Coding Theory (AGCT-10)
 Centre International de Recontres Mathématiques (CIRM)
 Luminy (Marserrile), France, September 26–30, 2005
 “On the minimum distance of one-point geometric Goppa codes.”
60. **Contributed talk**
8th Nordic Combinatorial Conference
 Aalborg University, Denmark, October 20–22, 2004
 ”On some Gröbner basis theoretical applications.”
61. **Conference organization**
 (joint with L. D. Andersen)
8th Nordic Combinatorial Conference
 Aalborg University, Denmark, October 20–22, 2004
62. **Workshop participation**
IEEE International Symposium on Information Theory (ISIT-2004)
 Chicago Downtown Marriot, Chicago, Illinois, USA, June 27–July 2, 2004. “Codes from Order Domains.”
63. **Invited talk**
Koderungstheorie
 Mathmatisches Forschungsinstitut Oberwolfach, Oberwolfach Germany, December 7–13, 2003
 “On the Missing Evaluation Codes from Order Domain Theory.”
64. **Invited talk**
Arithmetic, Geometry, Cryptography and Coding Theory (AGCT-9)
 Centre International de Recontres Mathématiques (CIRM), Luminy (Marseille), France, May 18–23, 2003
 “Codes from order domains.”
65. **Contributed talk**
IEEE International Symposium on Information Theory (ISIT-2002)
 Palais de Beaulieu, Lausanne, Switzerland, June 30– July 5, 2002
 “A Class of Gröbner Basis Theoretically Based Evaluation Codes.”
66. **Contributed talk**
Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-14)
 Melbourne, Australia, November 26–30, 2001
 (Presenting joint work with Tom Høholdt)
 “On hyperbolic codes”
67. **Contributed talk**
IEEE International Symposium on Information Theory (ISIT-2001)
 Omni Shoreham Hotel, Washington, D.C., USA, June 24–29, 2001

68. **Invited research stay**
 Technical University of Denmark, 1 week 2000
69. **Invited talk**
Combinatorial Theory Seminar
 Technical University of Eindhoven, The Netherlands, February 17, 1999
 “Evaluation Codes from order domains.”
70. **Invited talk**
Torsdagsseminar
 Department of Mathematical Sciences, Aalborg University, Denmark, May 20, 1999
 “Evaluation Codes and Order Domains.”
71. **Invited talk**
Coding Theory Days
 DAIMI, Aarhus University, Denmark, August 18–19, 1999
 “Evaluation Codes and Order Domains.”
72. **Contributed talk**
Winter School on Coding and Informatin Theory 1998 (IEEE)
 Ebeltoft, Denmark, December 13–16, 1998 “Evaluation Codes and Order Domains.”
73. **Invited research stay**
 Technical University of Eindhoven, The Netherlands, April–July, 1998.
74. **Contributed talk**
Winter School on Coding and Information Theory 1996 (IEEE) Mølle, Sweden, December 15–18, 1996
 “Presentation of PhD project.”

Popolarization

1. **Leading part**
The film project: “10 danske matematikere – 10 matematiske fortllinger’
 Publishing house: Lindhardt og Ringhof Uddannelse
 Producer: Bjørn Grøn, Camera: David Binzer, 2016
 “Olav Geil: Fejlkorrigerende koder”
2. **Invited lecture**
 Regionalmøde for matematiklærere ved gymnasiale uddannelser
 Aalborg Studenter Kursus, Denmark, February 3, 2016
 “Hvad gør man når høstakker er for stor?”
3. **Invited lecture**
Ungdommens Naturvidenskabelige Forening

Aalborg, Denmark, October 14, 2014
“Hvis tale er sølv, så er mange slags tal guld.”

4. **Invited lecture**

Møde for Matematiklærere i Nordjyske Region
Hasseris Gymnasium, Aalborg, Denmark, November 11, 2008
“Fejlkorrigerende koder og secret sharing (samt kryptografi og netværkkodning).”

5. **Invited lecture**

Elektronik og IT-Gruppen, Ingeniørforeningen i Danmark
Aalborg, Denmark, April 24, 2008
“Moderne kryptografi.”

6. **Invited lecture**

Møde for Matematiklærere i Viborg og Ringkøbing amter
Viborg Gymnasium, Denmark, November 7, 2006
“Fejlkorrigerende koder, secret sharing (og kryptografi)”

7. **Invited lecture**

Møde for Matematikundervisere p Seminarierne
Brogården, Middelfart, Denmark, September 9, 2003
“Diskret Matematik.”

8. **Invited lecture**

Ungdommens Naturvidenskabelige Forening
Aalborg, Denmark, February 6, 2001
“Fejlkorrigerende koder.”

9. **Several invited lectures**

Dronninglund Gymnasium (2002, 2004), Hjørring HTX (2003), Randers Statsskole (2003), Århus Katedralskole (2003, 2004), Nørre Sundby Gymnasium (2007), Vesthimmerlands Gymnasium (visiting AAU) (2007), Frederikshavn HTX (2007)
“Kodningsteori”