

Alessandro Siciliano

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Research interests

Finite geometries and their automorphism group

Algebraic varieties over finite fields

Error-correcting codes

Incidence matrices of combinatorial structures

Current Position

since may 2015 **Associate Professor**, *Department of Mathematics, Computer Science and Economy*, University of Basilicata, Potenza, Italy.

november 2001 - may 2015 **Permanent Research Associate (Italian Ricercatore confermato)**, *Department of Mathematics and Computer Science*, University of Basilicata, Potenza, Italy.

february 2012 **Qualification for *Professeur des universités, n. de qualification 12125226267***, Ministère de l'Enseignement Supérieur et de la Recherche, France.

february 2012 **Qualification for *Maître de conférences, n. de qualification 12225226267***, Ministère de l'Enseignement Supérieur et de la Recherche, France.

Scientific education

march 2001 **Ph.D. in Mathematics.**
University of Naples "Federico II", Italy
Research project: *Classical varieties over finite fields*
Supervisor: Prof. Gabor Korchmaros

october 1994 **Master in Teaching Applied Mathematics.**
University of Rome "La Sapienza", Italy

may 1993 **Degree (Laurea) in Mathematics - 110/110.**
University of Rome "La Sapienza", Italy
Research project: *Spazi lineari e loro gruppo di automorfismi*
Supervisor: Prof. P.V. Ceccherini

Further scientific experiences

- november 2000-
october 2001 **Post Doctoral position**, *Research group "Gruppi, Grafi e Geometrie" of Prof. Dina Ghinelli*, Department of Mathematics, University of Rome"La Sapienza", Italy.
- may 2014 **guest scientist**, *Department of Mathematics*, group of Prof. T. Penttila, Colorado State University, Forth Collins, CO, USA.
- january 2012 -
february 2012 **guest scientist**, *Department of Mathematical Sciences*, group of Prof. Qing Xiang, University of Delaware, Newark, DE, USA.
- june 2011 - july
2011 **guest scientist**, *Department of Mathematics and Statistics*, group of Prof. Oli King, Newcastle University, Newcastle Upon Tyne, United Kingdom.
- april 2011 - may
2011 **guest scientist**, *Department of Mathematical Sciences*, group of Prof. Qing Xiang, University of Delaware, Newark, DE, USA.
- may 2009
june 2009 **guest scientist**, *Department of Mathematics*, group of Prof. Frank de Clerck, Gent University, Belgium.
- july 2000 -
August 2000 **guest scientist**, *Institute of Mathematics, Statistics and Computer Science*, group of Prof. Fernando Torres, University of Campinas, Brasil.

Teaching

Department of Mathematics, Computer Science and Economics, University of Basilicata

- AYs 2011 – 2015 **Lecturer: Higher Geometry.**
- AYs 2010 – 2013 **Teaching Assistant: Geometry I.**
- AY 2012/2013 **Lecturer: Classical groups and Geometric algebra**, *International Doctoral Seminar "János Bolyai"*.
- AY 2010/2011 **Lecturer: Algebraic Design Theory**, *International Doctoral Seminar "János Bolyai"*.
- AY 2009/2010 **Lecturer: Geometry I.**
- AY 2007/2008 **Lecturer: Discrete Mathematics and Applications I.**
- AY 2002/2009 **Lecturer: Coding Theory and Cryptography .**
- AY 2002/2009 **Teaching Assistant: Geometry 5.**
- AY 2001/2002 **Teaching Assistant: Geometry 1.**

Other courses

- september 2003 **The geometry of commuting polarities**, *Summer school on Finite Geometry and Combinatorics*, University of Basilicata, Potenza, Italy.
- february 2003 **The geometry of small unitary groups**, *Lorand University*, Budapest, Hungary.

Supervision of students

- AY 2010/2011 **Diploma Thesis "Public-key Cryptosystems on Elliptic Curves"**, *Mario Mancusi*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed

- AY 2009/2010 **Diploma Thesis "Weight distribution of cyclic codes, Idempotents and Mattson-Solomon Polynomials**, *Maria Angela Federici*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2008/2009 **Diploma Thesis "Dual Codes and their weight distribution"**, *Marilena Ricciardi*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2008/2009 **Diploma Thesis "A special class of cyclic codes: the BCH codes"**, *Assunta Di Cataldo*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2005/2006 **Diploma Thesis "Linear blocking set in finite projective planes"**, *Loredana Caputo*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2003/2004 **Diploma Thesis "Perfect codes over finite fields"**, *Angelo Mancini*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2002/2003 **Diploma Thesis "The automorphism group of Goppa Codes"**, *Veronica Lanzolla*, Department of Mathematics and Computer Science, University of Basilicata.
Status: completed
- AY 2000/2001 **Diploma Thesis "Maximal curve and Goppa codes" (with Prof. D. Ghinelli)**, *Danielle Simoes Leite*, Department of Mathematics, University of Rome "La Sapienza".
Status: completed

Selected conferences & talks

Conferences as invited speaker

- june 2013 **Finite Geometry Workshop, Bolyai Institute, Szeged, HU.**
Translation ovoids in finite classical polar spaces.

Conference Talks since 1996

- september 2015 **Giornate di Geometria, Caserta.**
On Delsarte's linear MRD-codes and their automorphism group.
- september 2014 **Finite Geometries Fourth Irsee Conference, Irsee.**
Collineation groups containing a Singer cycle and elation unitals in Desarguesian projective planes.
- june 2014 **Combinatorics 2014, Gaeta, IT.**
Unitals with elation group of $PG(2, q^{2d})$ and eggs of $PG(4d - 1, q)$.
- july 2013 **Fq11 Conference, Magdeburg.**
Semilinear translation ovoids in finite unitary polar spaces.
- september 2012 **Combinatorics 2012, Perugia, IT.**
A new blocking semiovals in $PG(2, 25)$ with a large homology group.
- june 2010 **Combinatorics 2010, Verbania, IT.**
The geometry of elation groups and unitals.
- may 2009 **Galois Geometries and Applications, Gent, BE.**
Locally hermitian partial ovoids of unitary polar spaces.
- june 2008 **Combinatorics 2008, Costermano, IT.**
Commuting polarities and maximal partial ovoids of $H(4, q^2)$

- july 2006 **Combinatorics 2006**, *Ischia*, IT.
Some new two-character sets and their geometry
- may 2004 **International Conference on Incidence Geometry**, *La Roche en Ardenne*, BE.
Maximal subgroups in the Aschbacher's class C_5
- february 2003 **First Irsee Conference**, *Irsee*, DE.
Algebraic curves with Singer automorphisms
- june 2000 **Combinatorics 2000**, *Gaeta*, IT.
Linear sections of line Grassmannians over finite fields
- february 1999 **Conference MIUR/CFIN Project "Strutture geometriche, combinatoria e loro applicazioni"**, *Caserta*, IT.
Veronese varieties over finite fields and their projections
- june 1999 **Second Pythagorean Conference**, *Samos*, GR.
A Veronese-like map and caps
- june 1998 **Combinatorics '98**, *Mondello*, IT.
The geometry of hermitian matrices of order three over Galois fields
- september 1996 **Combinatorics '96**, *Assisi*, IT.
On the validity of a Benz condition for non-standard Galois fields and for \mathbb{Q}

Publications

- [1] A. Siciliano, *On the validity of a Benz condition for non-standard Galois fields and for \mathbb{Q}* , **Journal of Geometry** 55 (1996), pp. 162–167.
- [2] A. Siciliano, *A note on rational points of curves over finite fields*, **Expositiones Mathematicae** 18 (2000), pp. 83–93.
- [3] G. Korchmaros, A. Siciliano, A. Sonnino, *1-factorizations of complete multigraphs arising from finite geometry*, **Journal of Combinatorial Theory, Ser.A** 93 (2001), pp. 385–390.
- [4] A. Cossidente, A. Siciliano, *A geometric construction of an optimal $[67,9,30]$ binary code*, **IEEE Transactions on Information Theory** 47 (2001), pp. 1187–1189.
- [5] A. Cossidente, A. Siciliano, *The geometry of hermitian matrices of order three over Galois fields*, **European Journal of Combinatorics** 22 (2001), pp. 1047–1058.
- [6] A. Cossidente, D. Labbate, A. Siciliano, *Veronese varieties over finite fields and their projections*, **Designs, Codes and Cryptography** 22 (2001), pp. 19–32.
- [7] E. Ballico, A. Cossidente, A. Siciliano, *Tangent lines and postulation of subschemes of $PG(n, q)$* , **International Mathematical Journal** 9 (2002), pp. 915–921.
- [8] E. Ballico, A. Cossidente, A. Siciliano, *Mutually tangentially degenerate varieties*, **Results in Mathematics** 42 (2002), pp. 229–234.
- [9] A. Cossidente, A. Siciliano, *On tangent spaces and external flats to Grassmannians of lines over finite fields*, **Linear Algebra and its Applications** 347 (2002), pp. 81–89.
- [10] N. Durante, A. Siciliano, *B-geometries and flocks of hyperbolic quadrics*, **Journal of Combinatorial Theory, Ser. A** 102 (2003), pp. 425–431.
- [11] A. Cossidente, A. Siciliano, *Plane algebraic curves with Singer automorphisms*, **Journal of Number Theory** 99 (2003), pp. 373–382.
- [12] E. Ballico, A. Cossidente, A. Siciliano, *External flats to varieties in symmetric product spaces over finite fields*, **Finite Fields and their Applications** 9 (2003), pp. 300–309.
- [13] A. Cossidente, A. Siciliano, *On the largest minimal blocking set in $PG(2, 8)$* , **Australasian Journal of Combinatorics** 33 (2005), pp. 125–128.

- [14] A. Cossidente, A. Siciliano, *On some maximal subgroups in the Aschbacher's class C_5* , **Linear Algebra and its Applications** 403 (2005), pp. 285–290.
- [15] A. Cossidente, A. Gács, C. Mengyàn, A. Siciliano, T. Szönyi, Z. Weiner, *On large minimal blocking sets in $PG(2, q)$* , **Journal of Combinatorial Designs** 13 (2005), pp. 25–41.
- [16] A. Aguglia, G. Korchmaros, A. Siciliano, *Minimal covering of all chords of a conic in $PG(2, q)$, q even*, **Bulletin of the Belgian Mathematical Society Simon Stevin** 12 (2005), pp. 651–655.
- [17] G.L. Ebert, G. Marino, A. Cossidente, A. Siciliano, *Shult sets and translation ovoids of the Hermitian surface*, **Advances in Geometry** 6 (2006), pp. 523–542.
- [18] A. Cossidente, A. Siciliano, *The automorphism group of plane algebraic curves with Singer automorphisms*, **Designs, Codes and Cryptography** 39 (2006), pp. 33–37.
- [19] A. Siciliano, *Locally hermitian partial ovoids of unitary polar spaces and partial ovoids of orthogonal polar spaces*, **Innovations in Incidence Geometry** 6 (2007), pp. 63–73.
- [20] A. Cossidente, N. Durante, G. Marino, T. Penttila, A. Siciliano, *The geometry of some two-character sets*, **Designs, Codes and Cryptography** 46 (2008), pp. 231–241.
- [21] A. Cossidente, A. Siciliano, *Commuting polarities and maximal partial ovoids of $H(4, q^2)$* , **Journal of Combinatorial Designs** 17 (2009), pp. 307–313.
- [22] N. Durante, A. Siciliano, *The geometry of elation groups of a finite projective space*, **Mediterranean Journal of Mathematics**, 10 (2013), pp. 439–448.
- [23] N. Durante, A. Siciliano, *Unitals of $PG(2, q^2)$ containing conics*, **Journal of Combinatorial Designs**, 21 (2013), pp. 101–111.
- [24] K. Coolsaet, J. de Beule, A. Siciliano, *The known maximal partial ovoids of size $q^2 - 1$ of $Q(4, q)$* , **Journal of Combinatorial Designs**, 21 (2013), pp. 89–100.
- [25] N. Durante, A. Siciliano, *Some blocking semiovals of homology type in planes of square order*, **Designs, Codes and Cryptography**, 72 (2014), 185–193.
- [26] G. Donati, N. Durante, A. Siciliano, *Unitals in $PG(2, q^2)$ stabilized by a homology group*, **Designs, Codes and Cryptography**, 72 (2014), 135–139.
- [27] O. King, A. Siciliano, *Translation ovoids of unitary polar spaces*, **Advances in Geometry**, 14 (2014), 369–379.
- [28] T. Penttila, A. Siciliano, *On collineation groups of finite projective spaces containing a Singer cycle*, **Journal of Geometry**, accepted for publication.
- [29] N. Durante, A. Siciliano, *Non-linear maximum rank distance codes in the cyclic model for the field reduction of finite geometries*, submitted.

Recent grants

- 2010 - **MIUR/COFIN Project: Combinatorics and groups in Galois geometries**, Coordinated by Prof. G. Lunardon (University of Naples).
- 2006 - 2008 **MIUR/COFIN Project: Geometric Structures, combinatorics and their applications**, Coordinated by Prof. G. Lunardon (University of Naples).
- 2003 - 2005 **MIUR/COFIN Project: Geometric Structures and their applications**, Coordinated by Prof. G. Lunardon (University of Naples).

Referee's activity

Designs, Codes and Cryptography

Advances in Geometry
Innovations of Incidence Geometry
Mediterranean Journal of Mathematics
Boletín de la Sociedad Matemática Mexicana
Journal of Geometry

General skills

Languages Italian (native) , English (B2)
Scientific packages MAGMA, Mathematica
Operating systems UNIX/Linux, MacOS, Windows