

# CURRICULUM VITAE ET STUDIORUM OF THE SCIENTIFIC AND DIDACTIC ACTIVITY

DOMENICO FRENI

The undersigned Domenico Freni, born in Messina on August 24, 1956, residing in Udine, via Camillo Giussani n. 58, according to art. 76 of the Presidential Decree 445/2000, being aware that false declarations, training or use of false acts are punished pursuant to the penal code and special laws on the matter,

## States

### PERSONAL DATA

**Surname and name:** FRENI Domenico

**Date of birth:** 24/08/1956

**Birth place:** Messina

**Address:** Via Camillo Giussani 58 - 33100 Udine

### CURRENT POSITION

University Researcher from November 28, 1990, Confirmed Researcher from November 28, 1993 (he obtained the 2016 National Scientific Qualification Notice of the D.D. 1532/2016 Competition Sector 01 / A2 Geometry and Algebra BAND II.)

### CURRENT AFFILIATION

Department of Mathematical, Computer and Physical Sciences  
University of Udine  
Via delle Scienze, 206  
33100 Udine  
URL:<http://www.dimi.uniud.it>

### ACADEMIC QUALIFICATIONS

- **Degree in Mathematics** at the Faculty of Mathematical, Physical and Natural Sciences of the University of Messina on 10/03/1981, with a 110/110 Degree mark.

- **Ph.D.** University of Clermont-Ferrand. Tres Honorable rating. Thesis title: *Hypergroupes Cambistes - Hypergroupes de type U - Applications à la théorie de la dimension et à l'holologie non abelienne.*

#### SCHOLARSHIPS

- C.N.R. scholarships carried out at the Department of Mathematics of Clermont-Ferrand from 10/25/1983 to 7/24/85.

#### STUDY STAYS ABROAD

- Invited as visiting professor at the Blaise Pascal University of Clermont-Ferrand II from 12-05-1993 to 12-06-1993.
- Invited as visiting professor at the Blaise Pascal University of Clermont-Ferrand II from 20-11-1998 to 20-12-1998.

#### OTHER PROFESSIONAL EXPERIENCES

- Member of the Editorial Bord of the magazine "Magazine of pure and applied mathematics" A.A. 1994, 1995, 1996.
- Member of the Editorial Bord of the magazine "Italian Jurnal of Pure and Applied Mathematics" A.A. 1997.
- Cycle of seminars on Theory of Designs in the context of courses related to the PhD in Mathematics XXV cycle. Mathematics Department of the University of Messina from 10-06-2009 to 19-06-2009.

#### TEACHING ACTIVITY

- **Mathematics teaching contract** at the Faculty of Agriculture of the University of Udine (A.Y. 1985/86, 1986/87, 1987/88).
- **Geometry Exercises** for the Degree Courses in Civil Engineering, Mechanical Engineering, Management Engineering and Electronic Engineering of the Faculty of Engineering of the University of Udine.
- **Basic Mathematics courses** for the Faculty of Engineering and the Faculty of Economics in Pordenone.

- **Geometry course** for the University Diploma in Electronic Engineering and Environmental and Resource Engineering (A.A. 1994/95, 1995/96, 1996/97, 1997/98, 1998/99, 1999/2000)
- **Mathematics 1 (First Module)** for the Mechanical Engineering degree course in Pordenone. (A.A. 2000/01, 2001/02, 2002/03, 2003/04, 2004/05, 2005/06, 2006/07, 2007/08)
- **Linear Algebra course** for the degree course in Mechanical Engineering in Pordenone. (A.A. 2009/10, 2010/11, 2011/12)
- **Linear Algebra course** for the degree courses in Mechanical Engineering, Electronic Engineering and Management Engineering in Udine. (A.A. 2002/2003)
- **Linear Algebra course** for the degree course in Mechanical Engineering in Udine. (A.A. 2004/05, 2005/06, 2006/07, 2007/08, 2009/10, 2010/11, 2011/12, 2011/12, 2012/13, 2013/14)
- **Linear Algebra course** for the Civil Engineering degree course in Udine. (A.Y. 2012/13, 2013/14, 2014/15, 2015/16, 2016/17, 2017/18, 2018 /19)
- **Linear Algebra course** for the degree course in Management Engineering (borrowed with Electronic Engineering) in Udine (A.Y. 2017/18, 2018/19).
- **Linear Algebra course** for the degree course in Electronic Engineering in Udine (A.Y. 2017/18, 2018/19, 2019/2020).
- **18 teaching hours of Commutative Algebra** in the context of the teaching of Algebraic Geometry II whose head is Prof. Pietro De Poi, degree course in Mathematics, Udine (A.Y. 2019/20).
- **18 teaching hours of Homological Algebra** in the context of the teaching of Algebraic Geometry II whose head is Prof. Pietro De Poi, degree course in Mathematics, Udine (A.Y. 2019/20).

#### RESEARCH ACTIVITY

- **Participation in the PRIN 1997 project.** Scientific coordinator Francesco Mazzocca, scientific manager Piegiulio Corsini. University: University of Udine, Protocol 9701496810 - 010. Title: Hyperstructures and applications. From 5-02-1998 to 14-02-2000.

- **Participation in the PRIN 1999 project.** Scientific coordinator Guglielmo Lunardon, scientific director Renato Migliorato. University: University of Messina, Protocol 9901182153 - 018. Title: Graphics, design, hyperstructures and their applications. From 26-11-1999 to 25-11-2001.

- **Participation in the PRIN 2001 project.** Scientific coordinator Guglielmo Lunardon, scientific director Giovanni Lo Faro. University: University of Messina, Protocol 2001017228 - 002. Title: Hypergraphic, design and their applications. From 12-12-2001 to 11-12-2003.

- **Participation in the PRIN 2003 project.** Scientific coordinator Guglielmo Lunardon, scientific director Giovanni Lo Faro. University: University of Messina, Protocol 2003013538 - 002. Title: Hypergraphic, design and their applications. From 20-11-2003 to 19-11-2005.

- **Participation in the PRIN 2005 project.** Scientific coordinator Guglielmo Lunardon, scientific director Mario Gionfriddo. University: University of Catania, Protocol 2005018845 - 005. Title: Graphs, designs, codes and their applications. From 30-01-2006 to 29-01-2008.

- **Participation in the PRIN 2008 project.** Scientific coordinator Mario Gionfriddo, scientific manager Giovanni Lo Faro. University: University of Messina, Protocol 20087P 8M N 2 - 004. Title: Theory of designs, spectral graph theory, combinatorial theories and their applications. From 22-03-2010 to 22-09-2012.

- **Participation in the PRID 2017 project,** whose scientific responsible is Prof. Dikran Dikranjan.

- **Admitted to the funding of Euro 3,000 on basic research activities.** Ministry of Education and Scientific Research - Art.1, law 11 December 2015.

#### PARTICIPATION IN CONFERENCES

- Hypergroups, multivocal structures and algebraization of incidence structures. Taormina 1983;

- Hypergroups and applications. Udine 1987;

- Designs, Steiner systems, Multivocal structures. Milazzo 1991;

- Hypergroups and other multivocal structures. Udine 1992;
- Multivocal hyperstructures and applications. Udine 1994;
- Hyperstructures, Geometric Spaces and Probabilistic Applications. Chieti 1994;
- Hyperstructures and their applications in Critography, Geometry and Probability. Pescara 1995;
- Algebraic Hyperstructures and Applications. Praga 1996;
- Combinatorics 96. Assisi 1996;
- National UMI conference. Perugia 1997;
- Combinatorics 98. Palermo 1998;
- Algebraic and geometric structures. Caserta 1999;
- Algebraic Hyperstructures and Applications. Taormina 1999;
- International Symposium on Graphs, Designs, and Applications. Messina 2003;
- Days of Geometry. Messina 2004;
- Days of Geometry. Messina 2005;
- Combinatorics 2008. Costermano (VR) 2008;
- Combinatorics 2012. Perugia 2012;
- HyGraDe 2017 conference. S. Alessio Siculo 2017.

#### EDITORIAL PUBLICATIONS

Domenico Freni, Jung Kyu Canci - *Algebra lineare e Geometria, esercizi e complementi* - Pearson Education Bruno Mondatori (Gennaio 2008).

#### PUBLICATIONS ON MAGAZINES

The research activity concerns the theory of groups, semigroups, semihypergroups, hypergroups. He is the author or coauthor of the following articles:

1. *Semi hypergroups and regular equivalences* - Atti Sem. Mat. Fis. Univ. Modena, Vol. XXIX, 276- 293, (1980).
2. *Cyclic hypergroups and torsion in hypergroups* - Le Matematiche Catania, vol.XXXV, Fasc. I II, (1980).
3. *On  $r$ -hypergroups and expansions* - Atti Sem. Soc. Pelor. Sc. Fis. Mat. Nat.Univ. Messina, Vol. 27, 77-93, (1981).
4. *Structure des hypergroupes quotients et des hypergroupes de type  $U$*  - Ann. Sci.Univ. Clermont-Ferrand II, Fasc. 22, 51-77, (1984).
5. *Sur les hypergroupes cambistes* - Rendiconti Istituto Lombardo, Vol. 119, 175-186, (1985).
6. *Sur la théorie de la dimension dans les hypergroupes* - Acta Univ. Carolinae, Math. et Physica, Vol. 27, N. 2, (1986).
7. *Sur les hypergroupes de type  $U$  et sous-hypergroupes engendrés par un sous-ensemble* - Riv. Mat. Univ. Parma (4) 13, 29-41, (1987).
8. *Subhypergroups and strongly regular homomorphisms* - Riv. Mat. Pura e Applicata Univ. Udine, Vol. 2, 81-95, (1987).
9. *On canonical hypergroups and congruences* - Riv. Mat. Pura e Applicata Univ. Udine, Vol. 2, 81-95, (1987).
10. *On the  $A$ -hypergroups* - Atti Sem. Mat. Fis. Univ. Modena, 327-336, (1990).
11. *Une note sur le cœur d'un hypergroupe et sur la clôture transitive  $\beta^*$  de  $\beta$*  . Riv. Mat. Pura e Applicata Univ. Udine Vol. 8, 153-156 (1991).
12. *On a strongly regular relation in hypergroupoids* - P.U.M.A. Budapest Ser.A, Vol. 3, 191-198, (1992).
13. *Une note sur l'identité scalaire à droite d'un hypergroupe de type  $U$  à droite* - Le Matematiche Catania Vol. XLVII Fasc. I, 75-81, (1992).

14. *Hypergroupoids and Fundamental relations*, Atti Convegno su Algebraic hyperstructures and Applications, Iasi (Romania), Editor Hadronic Press U.S.A., 81-92, (1994).
15. *A note on cyclic hypergroups*, Ratio Mathematica Univ. Pescara Vol. 9, 101-111, (1995).
16. *Contribution to matroid hyperstructures*, Le Matematiche Catania, Vol. LII, Fasc. II, pp. 271-295, (1997).
17.  *$M_\lambda$ -matroidal hypergroups, applicazioni  $\lambda$ -linear applications and automorphisms of  $M_\lambda$ -hypergroupoids*, Le Matematiche Catania, Vol. LIII, Fasc. I, pp. 133-154, (1998).
18. *Applications  $(h, A)$ -linear, homomorphisms of  $M_A$ -hypergroupoids*, Le Matematiche Catania, Vol. LIV, Fasc. II, pp. 375-397, (1999).
19. *A new characterization of the derived hypergroup via strongly regular equivalences*, Communications in Algebra, Vol. 30, No. 8, pp.3977-3989, (2002).
20. *Strongly Transitive Geometric Spaces: Applications to Hypergroups and Semigroups Theory*, Communications in Algebra, Vol. 32, No. 3, pp. 969-988, (2004).
21. *Minimal order semihypergroups of type  $U$  on the right. II*, Journal of Algebra, Vol. 340, pp. 77-89, (2011).
22. *On cyclic and complete hypergroups* - Le Matematiche Catania, Vol. XXXV, Fasc. I II, (1980). (In collaboration with M. De Salvo)
23. *Semi hypergroups and cyclic hypergroups* - Atti Sem. Mat. Fis. Univ. Modena, XXX, 44-59, (1981). (In collaboration with M. De Salvo)
24. *Finitely generated hypergroups* - Riv. Mat. Univ. Parma (4) 12, 177-186, (1986). (In collaboration with M. De Salvo)
25. *On the heart of hypergroup* - Mathematica Montisnigris Montenegro, Vol. II, 21-27 (1993). (In collaboration with P. Corsini)
26. *Sur les hypergroupes de type  $U$*  - Mathematica Cluj Napoca (Romania), Tome 36 n.1, 25-32 (1994). (In collaboration with M. Gutan)

27. *Hypergroupe de type  $U$  et homologie de Complexes* - Algebra Universalis, Vol. 35, 34-62 (1996). (In collaboration with Y. Sureau)
28. *Sur le groupe des scalaires d'un hypergroupe* - Atti del convegno "New frontiers in hyperstructures and related algebras" Hadronic Press U.S.A. 103-124 (1995) (In collaboration with M. Gutan and Y. Sureau).
29. *On the hypergroups with four proper pairs and without scalars* - Annales Mathematiques Blaise Pascal, Vol. 3, n. 2, 67-109 (1996). (In collaboration with M. De Salvo and G. Lo Faro)
30. *On the hypergroups with four proper pairs and two or three non scalar elements* - Rendiconti del Circolo Matematico di Palermo Vol. 46, 29-51 (1997). (In collaboration with M. De Salvo and G. Lo Faro)
31. *On the hypergroups with four proper pairs and three or four non scalar elements* - Analele Stiintifice Ale Univ. Al. I Cuza Iasi (Romania), Vol. 43(1), pp. 103-132, (1997). (In collaboration with M. De Salvo and G. Lo Faro)
32. *Sur le groupe des automorphismes d'un groupoide* - Ann. Math. Blaise Pascal, Vol.5, n. 2, 21-37, (1998). (In collaboration with N. Rodinò)
33. *Existence of proper semihypergroups of type  $U$  on the right* - Discrete Mathematics, 307, pp. 2826-2836, (2007). (In collaboration with D. Fasino)
34. *A new family of hypergroups and hypergrups of type  $U$  on the right of size five* - Far East J. Math. Sci, 26(2), pp. 393-418, (2007). (In collaboration with M. De Salvo and G. Lo Faro)
35. *Minimal Order Semihypergroups of Type  $U$  on the Right* - Mediterranean Journal of Mathematics, 5, pp. 295-314, (2008). (In collaboration with D. Fasino)
36. *Hypergroups of type  $U$  on the right of size five. Part two* - Mathematicki Vesnik, 60, pp. 23-45, (2008). (In collaboration with M. De Salvo and G. Lo Faro)
37. *Isomorphism classes of the hypergroups of type  $U$  on the right of size five* - Computers and Mathematics with Applications, 58, pp. 390-402, (2009) (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)



38. *On the hypergroups of type  $U$  on the right of size five, with scalar identity* - J. Mult.-Valued Logic Soft Comput., 17, pp. 425-441 (2011) (In collaboration with M. De Salvo and G. Lo Faro)
39. *Fundamental relation in simple and 0-simple semihypergroups of small size* - Arabian Journal of Mathematics, vol. 1, p. 175-190 (2012) (In collaboration with D. Fasino)
40. *Hypergroups with a strongly unilateral identity* - J. Mult.-Valued Logic Soft Comput., vol. 21, p. 165-182 (2013) (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)
41. *On strongly conjugable extensions of hypergroups of type  $U$  with scalar identity* - Filomat vol. 27, p. 977-994 (2013) (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)
42. *Fully simple semihypergroups* - Journal of Algebra, vol. 399, p. 358-377 (2014) (In collaboration with M. De Salvo and G. Lo Faro)
43. *Fully simple semihypergroups, transitive digraphs, and sequence A000712* - Journal of Algebra, vol. 415, p. 65-87 (2014) (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)
44. *A family of 0-simple semihypergroups related to sequence A000070* - J. Mult.-Valued Logic Soft Comput., vol. 27, p. 553-572 (2016) (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)
45. *Hypercyclic Subhypergroups of Finite Fully Simple Semihypergroups* - J. Mult.-Valued Logic Soft Comput., vol. 29, p. 595-617 (2017) (In collaboration with M. De Salvo and G. Lo Faro)
46. *Semihypergroups obtained by merging of 0-semigroups with groups* - Filomat vol 32:12 (2018), 4177-4194 (In collaboration with M. De Salvo, D. Fasino and G. Lo Faro)
47. *On further properties of fully zero-simple semihypergroups* - Mediterr. J. Math. vol 16:48 (2019), 1-11 (In collaboration with M. De Salvo and G. Lo Faro)
48. *On hypercyclic fully zero-simple semihypergroups* - Turkish Journal of Mathematics, vol 43 (2019), 1905-1918 (In collaboration with M. De Salvo and G. Lo Faro)

49. *Some applications of algebraic entropy to the proof of Milnor-Wolf theorem* - Communication in Algebra, Vol. 47 (2019), 1-16 (In collaboration with W. Xi, D. Dikranjan and D. Toller)

50. *On Hypergroups with a  $\beta$ -Class of finite Height* - Symmetry, Vol. 12, 168 (2020), 1-14 (In collaboration with D. Fasino, M. De Salvo and G. Lo Faro)

Udine, li 21/01/2020

Domenico Freni