FRANCO DALFOVO
CURRICULUM VITAE

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Birth date and place: May 24, 1960, Mezzolombardo (Trento), Italy
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Education:

1989: PhD in Physics, Università di Padova and Trento; Thesis: "Surface properties of quantum liquids".
1985-1988: Postgraduate studies (Dottorato di Ricerca), Università di Padova and Trento.
July 1984: Laurea in Fisica, Università di Trento, 110/110 summa cum laude. Thesis: "Propagation of collective modes in Fermi liquids".

Appointments:

2013 – : Chairman of Recruitment and Promotion Committee of the University of Trento.
2010 – : Head of Trento Unit of Istituto Nazionale di Ottica, INO-CNR BEC Center.
2005 – 2008: Director of the Physics Department, Università di Trento.
2005 – : Full professor of Physics of Matter, Physics Department, University of Trento.
1999 – 2004: Associate professor, Faculty of Science, Università Cattolica del Sacro Cuore, Brescia.
1990 – 1999: Assistant professor (ricercatore), Faculty of Science, Università di Trento.
1988 – 1989: Postdoc fellow, Institut de Physique Nucleaire, Orsay, and Institut Laue-Langevin, Grenoble.

Teaching:

Courses in: General Physics (Mechanics, Thermodynamics, Electromagnetism), Quantum Mechanics, Statistical Physics, Superfluidity. Seminars in: Atomic Physics, History of Science and Epistemology, Theory of trapped Bose-Einstein condensates.

Research:

Theory of quantum gases, liquids and solids. Superfluidity and coherence. Bose-Einstein Condensation. Quantized vortices. Solitons. Helium nanodroplets. Fermi gases.

Memberships:

2007-: Associate Editor of Physical Review A.
2006-2015: member of the editorial board of the Journal of Low Temperature Physics.
2006: member of the editorial board of Physical Review A.
2003-2009: member of the Steering Committee of the International Symposium on Quantum Fluids and Solids.
2005-: associate to CNR – Consiglio Nazionale delle Ricerche
1995-2004: member of Istituto Nazionale per la Fisica della Materia
1986-1996, 2015-: associate to Istituto Italiano di Fisica Nucleare

Conference organization:

1995 - 2007: organizer of the national annual meeting "Fisica Teorica e Struttura della Materia" and member of the scientific committee.
Member of the organizing committee of: Workshop on "Clusters of Quantum Fluids" (Trento, June 1989), International Workshop on "Bose-Einstein Condensation" (Levico Terme, June 1993), Workshop on "Rotating Bose-Einstein condensates" (Trento, June 2000), Workshop on "The Physics of Quantum Fluid Clusters" (ECT*, Trento,

September 2002).
Chairman of the International Symposium on Quantum Fluids and Solids – QFS2004 (Trento, July 2004).

H-index: 32
Citations: 6619
Citations without self-citations: 6410
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Publications:

1. F.Dalfovo and S.Stringari, *Macroscopic models for sound propagation in normal liquid 3He*, Il Nuovo Cimento 6 D, 445 (1985)
2. F.Dalfovo and S.Stringari, *Hartree-Fock calculations for 3He-4He mixtures at zero temperature*, Phys. Lett. 112 A, 171 (1985)
3. F.Dalfovo and S.Stringari, *Surface state of 3He on liquid 4He*, Physica Scripta 38, 204 (1988)
4. F.Dalfovo and S.Stringari, *Effects of temperature and magnetization on the maximum solubility of 3He in 4He*, J. Low Temp. Phys. 71, 311 (1988)
5. F.Dalfovo and S.Stringari, *Sum rules and spin multipair excitations in liquid 3He*, Phys. Rev. Lett. 63, 532 (1989)
6. F.Dalfovo, *3He impurities on 4He clusters*, Z. Phys. D 14, 263 (1989)
7. F.Dalfovo and S.Stringari, *Surface tension of liquid 3He at low temperature*, J. Low Temp. Phys. 77, 307 (1989)
8. S.Stringari and F. D., *Magnetic susceptibility and collisionless spin waves in liquid 3He and 3He-4He mixtures*, J. Low Temp. Phys. 78, 1 (1990)
9. F.Dalfovo, J.Dupont-Roc, N.Pavloff, S.Stringari and J. Treiner, *Freezing of Liquid Helium at Zero Temperature: a Density Functional Approach*, Europhys. Lett. 16, 205 (1991)
10. F.Dalfovo, *Structure of vortices in helium at zero temperature*, Phys. Rev. B 46, 5482 (1992)
11. F.Dalfovo, G.Renversez and J.Treiner, *Vortices with more than one quantum of circulation in 4He at negative pressure*, J. Low Temp. Phys. 89, 425 (1992)
12. F.Dalfovo, *Density Functional Calculations for the Structure of Vortices in Superfluid 4He*, J. Low Temp. Phys. 89, 453 (1992)
13. F.Dalfovo and S.Stringari, *Static Response Function in Superfluid 4He*, J. Low Temp. Phys. 89, 325 (1992)
14. F.Dalfovo and S.Stringari, *Static Response Function for Longitudinal and Transverse Excitations in Superfluid Helium*, Phys. Rev. B 46, 13991 (1992)
15. J.Boronat, F. D., F.Mazzanti and A.Polls, *Dynamic Structure Function in 3He-4He Mixtures*, Phys. Rev. B 48, 7409 (1993)
16. F.Dalfovo, *Atomic and Molecular Impurities in 4He Clusters*, Z. Phys. D 29, 61 (1994)
17. A.Belic, F. D., S. Fantoni, and S. Stringari, *Variational Calculations for 3He impurities on 4He droplets*, Phys. Rev. B 49, 15253 (1994)
18. J.Boronat, F. D., F.Mazzanti and A.Polls, *Dynamic Structure Function in 3He-4He Mixtures*, Physica. B 194-196, 859 (1994)
19. A.Lastri, F. D., L. Pitaevskii, and S. Stringari, *Dispersion of ripplons in superfluid 4He*, J. Low Temp. Phys. 98, 227 (1995)
20. M. Casas, F. D., A. Lastri, Ll. Serra, and S. Stringari, *Density Functional calculations for 4He clusters*, Z. Phys. D 35, 67 (1995)
21. F.Dalfovo, A. Lastri, L. Pricaupenko, S. Stringari, J. Treiner, *Structural and dynamical properties of superfluid helium: a density functional approach*, Phys. Rev. B 52, 1193 (1995)
22. J.Boronat, J. Casulleras, F. D., S. Stringari, and S. Moroni, *Bounds for the phonon-roton dispersion in superfluid 4He*, Phys. Rev. B 52, 1236 (1995)
23. A. Polls, F. Mazzanti, J. Boronat, F. D. and A. Fabrocini, *Dynamic Structure function of 3He-4He mixtures in the deep inelastic regime,* in *Recent Progress in Many-Body Theories,* Vol. 4, Edited by E.Schachinder et al. (Plenum Press, NY, 1995)
24. F.Dalfovo, A. Fracchetti, A. Lastri, L. Pitaevski, and S. Stringari, *Rotons and quantum evaporation from superfluid 4He*, Phys. Rev. Lett. 75, 2510 (1995)
25. F.Dalfovo and S. Stringari, *Bosons in anisotropic traps: Ground state and vortices*, Phys. Rev. A 53, 2477 (1996)
26. F.Dalfovo, A. Fracchetti, A. Lastri, L. Pitaevskii and S. Stringari, *Quantum Evaporation from the Free Surface of Superfluid 4He*, J. Low Temp. Phys. 104, 367 (1996)
27. F.Dalfovo, L. Pitaevskii, and S. Stringari, *The condensate wave function of a trapped atomic gas*, J. Res. Nat. Inst. Stand. Tech. 101, 537 (1996)
28. F.Dalfovo, L. Pitaevskii, and S. Stringari, *Order parameter at the boundary of a trapped Bose gas*, Phys.

Rev. A 54, 4213 (1996)
29. F.Dalfovo, L. Pitaevskii and S. Stringari, *Bosons in a magnetic trap: the condensate wave function*, Physica Scripta T66, 234 (1996)
30. F.Pederiva, F. D., S. Fantoni, L. Reatto, and S. Stringari, *Variational study of a 3He impurity and of a vacancy in solid 4He*, Phys. Rev. B 55, 3122 (1997)
31. F.Dalfovo, C. Minniti, S. Stringari and L. Pitaevskii, *Nonlinear Dynamics of a Bose Condensed Gas*, Phys. Lett. A 227, 259 (1997)
32. F.Dalfovo, M. Guilleumas, A. Lastri, L. Pitaevskii, and S. Stringari, *Quantum evaporation from superfluid helium at normal incidence*, J. Phys.: Condens. Matter 9, L369 (1997)
33. F.Dalfovo, S. Giorgini, M. Guilleumas, L. Pitaevskii and S. Stringari, *Collective and single-particle excitations of a trapped Bose gas*, Phys. Rev. A 56, 3840 (1997)
34. F.Dalfovo, C. Minniti and L.P. Pitaevskii, *Frequency Shift and Mode Coupling in the Nonlinear Dynamics of a Bose Condensed Gas*, Phys. Rev. A 56, 4855 (1997)
35. M.Guilleumas, F. D., I. Oberosler, L.Pitaevskii and S. Stringari, *Scattering of elementary excitations at the surface of superfluid 4He*, J. Low Temp. Phys. 110, 449 (1998)
36. J.Harms, J.P. Toennies, and F. D., *Density of superfluid helium droplets*, Phys. Rev. B 58, 3341 (1998)
37. M.R.Matthews, D.S. Hall, D.S. Jin, J.R. Ensher, C.E. Wieman, E.A. Cornell, F. D., C. Minniti, and S. Stringari, *Dynamical Response of a Bose-Einstein Condensate to a Discontinuous Change in Internal State*, Phys. Rev. Lett. 81, 243 (1998)
38. F.Dalfovo, S. Giorgini, L.P. Pitaevskii and S. Stringari, *Theory of Bose-Einstein condensation in trapped gases*, Rev. Mod. Phys. 71, 463 (1999)
39. F.Dalfovo, *Dynamics of trapped Bose-condensed gases in mean-field theory*, Proceedings of the Int. School E. Fermi, Varenna, 1998, p.555 (1999)
40. C.Callegari, A. Conjusteau, I. Reinhard, K. K. Lehmann, G. Scoles, F. D., *A superfluid hydrodynamic model for the enhanced moments of inertia of molecules in liquid 4He*, Phys. Rev. Lett. 83, 5058 (1999); 84, 1848(E) (2000).
41. F.Dalfovo and M. Modugno, *Free expansion of Bose-Einstein condensates with quantized vortices*, Phys. Rev. A 61, 023605 (2000)
42. F.Dalfovo, R. Mayol, M. Pi, and M. Barranco, *Pinning of quantized vortices in helium drops by dopant atoms and molecules*, Phys. Rev. Lett. 85, 1028 (2000)
43. M.Modugno, F. D., C. Fort, P. Maddaloni, F. Minardi, *Dynamics of two colliding Bose-Einstein condensates in an elongated magneto-static trap*, A Phys. Rev. A 62, 063607 (2000)
44. A.Brunello, F. D., L. Pitaevskii and S. Stringari, *How to measure the Bogoliubov quasiparticle amplitudes in a trapped condensate*, Phys. Rev. Lett. 85, 4422 (2000)
45. M.Pi, R. Mayol, M. Barranco, and F. D., *Vortices in doped 4He clusters*, J. Low Temp. Phys. 121, 423 (2000)
46. F.Dalfovo and S. Stringari, *Shape deformations and angular momentum transfer in trapped Bose-Einstein condensates*, Phys. Rev. A 63, 011601(R) (2001)
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50. M.Barranco, R. Mayol, M. Pi, and F. D., *Pinning of quantized vortices in mixed 3He-4He droplets*, J. Low Temp. Phys. 126, 281 (2002)
51. J.Steinhauer , N.Katz, R.Ozeri, N.Davidson, C.Tozzo, and F.Dalfovo, *Bragg spectroscopy of the multi-branch Bogoliubov spectrum of elongated Bose-Einstein condensates,* Phys. Rev. Lett . 90, 060404 (2003).
52. C. Tozzo and F. D., *Bogoliubov spectrum and Bragg spectroscopy of elongated Bose-Einstein condensates*, New J. Phys. 5, 54 (2003)
53. G. Benedek, R. Grisenti, J.P. Toennies, and F. D., *Deep penetration of vacancies into a solid*, J. Electron Spectrosc. 129, 201 (2003).
54. N. Katz, R. Ozeri, N. Davidson, C. Tozzo, F. D., *High sensitivity phonon spectroscopy of Bose-Einstein condensates using matter-wave interference,* Phys. Rev. Lett. 93, 220403 (2004) .
55. C. Tozzo and F. D., *Phonon evaporation in freely expanding Bose-Einstein condensates*, Phys. Rev. A 69, 053606 (2004).
56. M. Modugno, C. Tozzo, F. D., *Role of transverse excitations in the instability of Bose-Einstein condensates moving in optical lattices*, Phys. Rev. A 70, 043625 (2004).
57. M. Kraemer, C. Tozzo and F. D., *Parametric excitation of a Bose-Einstein condensate in a 1D optical lattice*, Phys. Rev. A 71, 061602(R) (2005) .
58. F. Ancilotto, F. D., L.P. Pitaevskii and F. Toigo, *Density pattern in supercritical flow of liquid 4He*, Phys. Rev. B 71, 104530 (2005).
59. G. Benedek, F. D., R. E. Grisenti, M. Kaesz, and J. P. Toennies, *Oscillations in the expansion of solid 4He into*

vacuum, Phys. Rev. Lett. 95, 095301 (2005).
60. C. Tozzo, M. Krämer, and F. D., *Stability diagram and growth rate of parametric resonances in Bose-Einstein condensates in one-dimensional optical lattices*, Phys. Rev. A 72, 023613 (2005).
61. F. D., L.P. Pitaevskii and S. Stringari, *Bose-Einstein condensates*, Encyclopedia of Mathematical Physics (Elsevier, 2006), Vol.1, p.312.
62. M. Modugno, C. Tozzo, F. D., *Detecting phonons and persistent currents in toroidal Bose-Einstein condensates by means of pattern formation,* Phys. Rev. A 74, 061601(R) (2006).
63. S. Tsuchiya, F. D., C. Tozzo, and L. Pitaevskii, *Stability and excitations of solitons in 2D Bose-Einstein condensates*, J. Low Temp. Phys. 148, 393 (2007).
64. M. Antezza, F. D., L. P. Pitaevskii, and S. Stringari, *Dark solitons in a superfluid Fermi gas*, Phys. Rev. A 76, 043610 (2007).
65. Shunji Tsuchiya, F.Dalfovo, Lev P. Pitaevskii, *Solitons in two-dimensional Bose-Einstein condensates*, Phys. Rev. A 77, 045601 (2008).
66. Gentaro Watanabe, G. Orso, F. D., L.P. Pitaevskii, and S. Stringari, *Equation of state and effective mass of the* unitary Fermi gas in a 1D periodic potential, Phys. Rev. A 78, 063619 (2008).
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68. Marco Larcher, F. D., and Michele Modugno, *Effects of interaction on the diffusion of atomic matter waves in one-dimensional quasi-periodic potentials*, Phys. Rev. A, 80, 053606 (2009).
69. M.Larcher, M.Modugno, and F.D*, Localization in momentum space of ultracold atoms in incommensurate lattices*, Phys. Rev. A 83, 013624 (2011).
70. Gentaro Watanabe, F. D., L.P. Pitaevskii, S. Stringari, *Effects of periodic potentials on the critical velocity of superfluid Fermi gases in the BCS-BEC crossover,* Phys. Rev. A 83, 033621 (2011).
71. R.G. Scott, F. D., L.P. Pitaevskii, S. Stringari, *Dynamics of dark solitons in a trapped superfluid Fermi gas,* Phys. Rev. Lett. 106, 185301 (2011).
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73. Gentaro Watanabe, Sukjin Yoon, F. D., *Swallowtails of the Superfluid Fermi Gas in an Optical Lattice*, Phys. Rev. Lett 107, 270404 (2011).
74. R.G. Scott, F. D., L.P. Pitaevskii, S. Stringari, O.Fialko, R.Liao, J. Brand, J., *The decay and collisions of dark solitons in superfluid Fermi gases*, New. J. Phys. 14, 023044 (2012).
75. M.Larcher, T.V.Laptyeva, J.D.Bodyfelt, F. D., M.Modugno, S.Flach,*Subdiffusion of nonlinear waves in quasiperiodic potentials*, New J. Phys. 14 103036 (2012)
76. R. G. Scott, F. D., L. P. Pitaevskii, S. Stringari, *Rapid ramps across the BEC-BCS crossover: a novel route to measuring the superfluid gap*, Phys. Rev. A 86, 053604 (2012)
77. G.Lamporesi, S.Donadello, S.Serafini, F.Dalfovo, G.Ferrari, *Spontaneous creation of Kibble-Zurek solitons in a Bose-Einstein condensate,* Nat. Phys. 9, 656 (2013)
78. A. Cetoli, J. Brand, R.G. Scott, F. Dalfovo, L.P. Pitaevskii, *Snake instability of dark solitons in fermionic superfluids*, Phys. Rev. A 88, 043639 (2013)
79. S.Donadello, S.Serafini, M.Tylutki, L.P. Pitaevskii, F.Dalfovo, G.Lamporesi, G.Ferrari, *Observation of Solitonic Vortices in Bose-Einstein Condensates*, Phys. Rev. Lett. 113, 065302 (2014)
80. Peng Zou, F.Dalfovo, *Josephson oscillations and self-trapping of superfluid fermions in a double-well potential*, J.Low Temp. Phys. 177, 240 (2014)
81. M.Tylutki, S.Donadello, S.Serafini, L.P.Pitaevskii, F.Dalfovo, G.Lamporesi, and G.Ferrari, *Solitonic Vortices in Bose-Einstein Condensates*, Eur. Phys. J. Special Topics 224, 577 (2015)
82. S.Serafini, M.Barbiero, M.Debortoli, S.Donadello, F.Larcher, F.Dalfovo, G.Lamporesi and G.Ferrari, *Dynamics and interaction of vortex lines in an elongated Bose-Einstein condensate*, Phys. Rev. Lett. 115, 170402 (2015)
83. Sukjin Yoon, Franco Dalfovo, Takashi Nakatsukasa, Gentaro Watanabe, *Multiple Period States of the Superfluid Fermi Gas in an Optical Lattice*, New J. Phys. 18, 023011 (2016)
84. Marek Tylutki, Alessio Recati, Franco Dalfovo, Sandro Stringari, *Dark-Bright Solitons in a Superfluid Bose-Fermi Mixture*, New J. Phys. 18, 053014 (2016)
85. S.Donadello, S.Serafini, T.Bienaimé, F.Dalfovo, G.Lamporesi, G.Ferrari, *Creation and counting of defects in a temperature quenched Bose-Einstein Condensate*, Phys. Rev. A 94,023628 (2016)