

CURRICULUM VITAE

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Past employment

2001-2011: assistant professor - Università degli Studi di Milano.
2000-2001: research scientist - I.N.F.M. and SISSA - Trieste, Italy, in E. Tosatti's group.
1995-2000: research scientist - E.S.R.F. - Grenoble - France, in M. Altarelli's group.
1992: 6 months' research grant - Yale Univ. - New Haven CT - USA, in F. Iachello's group.

Education

1995, Oct. 27 - PhD in Condensed Matter Theory at SISSA - Trieste - Italy *cum summa laude*. Supervisor: E. Tosatti. External referee: D. Baeriswyl. Thesis: *Electron - Vibron Coupling in Charged Fullerene, Berry Phase, and Superconductivity*, <http://www.sissa.it/cm/thesis/1995/manini.ps.gz>.

1991, Sep. 19 - Master Degree in Physics at Università degli Studi di Trento - Italy, with full marks and honor *110/110 cum laude*. Thesis title: *Vibrational Spectroscopy of Four-atomic Molecules*. Supervisors: F. Iachello (Yale University), S. Oss, and M. Scotoni (Trento University).

Current research projects

Optical properties of carbon nanotubes.

Nanofriction: bridging the gap to the nano to the macro scale.

Ab-initio calculation of several structural, mechanical, and spectroscopical properties of 1D carbon-only chains (carbynes).

Calculation of the vibrational spectra of triatomic and 4-atomic molecules, within an algebraic model based on anharmonic Morse coordinates.

Polarizability and phase transitions in ionic liquids droplets.

Research Focus

Investigation of the collective dynamics of cold gases of weakly interacting atomic Fermions, Bosons, and mixtures. In particular NM and collaborators formulated a popular mean-field expression for the self-interaction in the crossover from the BCS to the BEC limits, studied the nonlinear dynamics of such atomic gas droplets in several experimentally relevant configurations.

NM used classical molecular dynamics to investigate the formation of mesophases in ionic liquids then films, and the layering of such films when wetting solid surfaces.

A whole line of research covers several phenomena of lubricated nanofriction. Specifically, NM discovered soliton-related velocity quantization phenomena in classical models for hard lubricants. Recent research focuses on energy dissipation in quantum-mechanical mesoscopic models.

Ab-initio self-energy corrections in metals: NM collaborated to develop a procedure to deal systematically with the Drude contribution to the dielectric response of metals, with applications in the calculations of optical response, electron energy loss and GW quasiparticle calculation.

Vibrational spectra of polyatomic molecules. Early studies for NM's graduation thesis, where anharmonic algebraic models were applied to the vibrational spectra of HCNO and H₂O₂ (continued software maintenance and upgrade, <http://alpha.science.unitn.it/~oss/vibr3at.html>). This interest was revived recently with the development of a novel and promising method to compute ab-initio the full vibrational spectrum, including high overtone and combination states, in a spectral region where anharmonic effects are dominant.

Electron-phonon interaction in fullerene ions and ionic materials. Properties of the dynamical Jahn-Teller ions, role of a geometric phase, related to different experimental features such as: (i) anomalous attachment of thermal electrons to fullerene; (ii) characteristic splittings in the vibronic spectrum; (iii) reduction of the magnetic g-factor of fullerene anions; (iv) solid-state phenomena, including superconductivity; (v) phonon shakeups in photoemission from molecular C₆₀, with full account of vibronic interaction in the final C₆₀⁺ states; (vi) ab-initio calculations of structure and spectra of fullerenes; (vii) electron-electron screened Coulomb couplings in the degenerate shell of positive C₆₀ ions; (viii) insulating and superconducting states of alkali-doped C₆₀ materials, in particular NH₃K₃C₆₀ using dynamical mean field theory mainly in the exact diagonalization flavor. Related more conceptual work

dealt with the Jahn-Teller effect and vibronic couplings in icosahedral systems, in particular the ground-state symmetry of such systems, related to the presence or absence of a geometric phase, and with many-modes dynamical Jahn-Teller.

The new concept of off-diagonal geometric phases, extending the traditional Berry phase (collaboration with F. Pistolesi) to open paths and relating several quantum states.

Photoemission from heavy-fermion metals, within the Kondo lattice model away from half filling, using dynamical mean-field theory in the numerical renormalization group flavor (DMFT-NRG).

Magnetic circular dichroism in X-ray absorption spectroscopy of metal Ni within a small cluster model treatable with exact diagonalization.

Teaching experience

Supervised students (Milan University):

PhD:

A. Bordoni - <http://www.mi.infm.it/manini/theses/BordoniPhD.pdf>

4/5-years (master) diploma:

D. Dragoni - <http://www.mi.infm.it/manini/theses/dragoni.pdf>

N. Ferri - <http://www.mi.infm.it/manini/theses/ferriMag.pdf>

I.E. Castelli - <http://www.mi.infm.it/manini/theses/castelliMag.pdf>

C. Negri - <http://www.mi.infm.it/manini/theses/negriMag.pdf>

M. Cesaratto - <http://www.mi.infm.it/manini/theses/cesarattoMag.pdf>

F. Bonelli - <http://www.mi.infm.it/manini/theses/bonelliMag.pdf>

A. Miglio - <http://www.mi.infm.it/manini/theses/miglio.pdf>

M. Cazzaniga - <http://www.mi.infm.it/manini/theses/cazzaniga.pdf>

P. Gattari - <http://www.mi.infm.it/manini/theses/gattari.pdf>

A. Del Monte - http://www.mi.infm.it/manini/theses/del_monte.pdf

A. Bordoni - <http://www.mi.infm.it/manini/theses/bordoni.pdf>

3-years *laurea* degree:

G.E. Roat - <http://www.mi.infm.it/manini/theses/roat.pdf>

M. Isella - <http://www.mi.infm.it/manini/theses/isella.pdf>

S.V. Paronuzzi Ticco - <http://www.mi.infm.it/manini/theses/paronuzzi.pdf>

P. Comensoli - <http://www.mi.infm.it/manini/theses/comensoli.pdf>

G. Pungillo - <http://www.mi.infm.it/manini/theses/pungillo.pdf>

M. Manzoni - <http://www.mi.infm.it/manini/theses/manzoni.pdf>

R. Meloni - <http://www.mi.infm.it/manini/theses/meloni.pdf>

M. Zecchin - <http://www.mi.infm.it/manini/theses/zecchin.pdf>

F. Brivio - <http://www.mi.infm.it/manini/theses/brivio.pdf>

P. Ponzellini - <http://www.mi.infm.it/manini/theses/ponzellini.pdf>

G. Pagano - <http://www.mi.infm.it/manini/theses/pagano.pdf>

A. Paroni - <http://www.mi.infm.it/manini/theses/paroni.pdf>

E. Diato - <http://www.mi.infm.it/manini/theses/diato.pdf>

N. Ferri - <http://www.mi.infm.it/manini/theses/ferri.pdf>
N.S. Falzoi - <http://www.mi.infm.it/manini/theses/falzoi.pdf>
B. Van Hattem - http://www.mi.infm.it/manini/theses/van_hattem.pdf
E. Distante - <http://www.mi.infm.it/manini/theses/distante.pdf>
C. Negri - <http://www.mi.infm.it/manini/theses/negri.pdf>
I.E. Castelli - <http://www.mi.infm.it/manini/theses/castelli.pdf>
F. Caruso - <http://www.mi.infm.it/manini/theses/caruso.pdf>
M. Cesaratto - <http://www.mi.infm.it/manini/theses/cesaratto.pdf>
M. Korbman - <http://www.mi.infm.it/manini/theses/korbman.pdf>
F. Bonelli - <http://www.mi.infm.it/manini/theses/bonelli.pdf>
A. Bugada - <http://www.mi.infm.it/manini/theses/bugada.pdf>
G. Diana - <http://www.mi.infm.it/manini/theses/diana.pdf>
E. Cinquanta - <http://www.mi.infm.it/manini/theses/cinquanta.pdf>
G. Divitini - <http://www.mi.infm.it/manini/theses/divitini.pdf>
G. La Spada - http://www.mi.infm.it/manini/theses/la_spada.pdf
F. Dalla Piazza - http://www.mi.infm.it/manini/theses/dalla_piazza.pdf

Courses Taught:

2010: *Surface Physics 1 (Fisica delle Superfici 1, 48 hours/year)* - Master diploma in Physics - Milan University.

2008-2009: *Physical methods applied to biotechnology, (Metodi fisici applicati alle biotecnologie, 24 hours/year)* - Master diploma in biotechnology - Milan University. Lecture slides and topics summary at http://www.mi.infm.it/manini/dida/Metodi_Fisici_Biotecnologie.html.

2003-: topic course *Quantum Theory of Matter* for the PhD programme - Milan University (10 hours/year).

2003-2009: *Structure of Matter 1 (Struttura della Materia 1, 60 hours/year)* bachelor degree in Physics - Milan University. Lecture notes and exercises at http://www.mi.infm.it/manini/dida/Struttura_della_Materia_1.html.

2001-2003: practicals for *Structure of Matter (Struttura della Materia, 30 hours/year)* - 4-years Master diploma in Physics - Milan University.

2002-2010: appointed teacher of *Vibronic effects in molecules and molecular solids* at SISSA, Trieste

1994, 1995, 2000: trainer of the Italian Physics Olympiads Team.

1991-1992: high-school level math and physics for students aged 13 to 19, in Trento (16 weeks - 18 hours/week).

Administrative experience

2001-: participation to several funded projects (Italian COFIN, FIRB, Cariplo Foundation; European Union NoE).

2008: member of the committee for the selection of the E.T.S.F. director.

2007- : member of the Teachers executive committee (Giunta) for the Physics Diploma at Milan University.

2006-2008: member of the Science Faculty executive committee (Giunta) of Milan University.

2003-2011: Member (until 2007: Scientific Secretary) of the Council of teachers of the Physics PhD programme of Milan University.

2000-2001: administrative tasks within the SISSA I.N.F.M. research unit.

1998- : Referee service for Chem. Phys. Lett., Commun. Theor. Phys., Comput. Theor. Chem., Eur. Phys. J. B, Europhys Lett., J. Mol. Struct., J. Phys. B, J. Phys. Chem. Solids, Philos. Mag., Phys. Lett. A, Phys. Rev. A + B + E + Lett., Tribol. Lett., and Rep. Math. Phys. 1999-2000: initial developer and administrator of <http://www.esrf.eu/UsersAndScience/Experiments/CMTheory> (E.S.R.F. theory group).

1994-1995: initial developer and administrator of <http://www.sissa.it/cm/> (SISSA condensed matter theory group).

Conference organization

2010-2011: co-organizer of the *Joint ICTP/FANAS Conference on Trends in Nanotribology*, Trieste, Sep. 12-16, 2011 <http://agenda.ictp.it/smr.php?2259> .

2008-2009: co-organizer of the *Joint ICTP/FANAS Conference on Trends in Nanotribology*, Trieste, Oct. 19-24, 2009 <http://agenda.ictp.it/smr.php?2063> , and co-editor of the proceedings Tribology Letters vol. 39/3 <http://www.springerlink.com/content/1023-8883/39/3/>

2005-2006: co-organizer of the *International Symposium on the Jahn-Teller Effects: Novel Aspects in Orbital Physics and Vibronic Dynamics of Molecules and Crystals*, Trieste, Aug. 28-31, 2006 http://cdsagenda5.ictp.trieste.it/full_display.php?ida=a05220 , and co-editor of the proceedings J. Mol. Struct. vol. 838 <http://www.sciencedirect.com/science/issue/5262-2007-991619998-659403> .

2003-2004: co-organizer of the Mini-Colloquium *Theory of Optical and Dielectric Properties of Condensed Matter* at the 20th General Conference Condensed Matter Division European Physical Society, Prague, July 19-23, 2004.

2003-2004: co-organizer of the *Fullerene - Solid State Symposium at 205rd Meeting of The Electrochemical Society*, San Antonio, TX, USA, May 9-13, 2004.

Languages

Italian: Mother tongue; English: Excellent; French: Good.

Computing

Environments: unix (linux, aix, hp-ux...), MS-dos/windows, Mac OS, vms.

Programming: c++, Mathematica, perl, python, fortran, unix shell/sed/awk, html, use of standard libraries and parallel-computer environments.

Editors/utilities: emacs, latex, xmgrace, gimp, xfig, MS/open office...

Publications in peer-reviewed journals

68. *Modeling friction: from nano to meso scales*, A. Vanossi, N. Manini, M. Urbakh, S. Zapperi, and E. Tosatti, arXiv:1112.3234, submitted to Rev. Mod. Phys.
67. *Carbynes as construction elements*, I.E. Castelli and N. Manini arXiv:1106.0689, submitted to Phys. Rev. B.
66. *Interfacial layering of a room-temperature ionic liquid thin film on mica: a computational investigation*, D. Dragoni, N. Manini, and P. Ballone, ChemPhysChem **13**, 1772 (2012).
65. *Carbon sp chains in graphene nanoholes*, I.E. Castelli, N. Ferri, G. Onida, and N. Manini, J. Phys.: Condens. Matter **24**, 104019 (2012).
64. *Nano-indentation of a room-temperature ionic liquid film on silica: a computational experiment*, P. Ballone, M.G. Del Popolo, S. Bovio, A. Podestà, P. Milani, and N. Manini, Chem. Phys. Phys. Chem. **14**, 2475 (2012).
63. *Vibrational characterization of dinaphthylpolyynes: A model system for the study of end-capped sp carbon chains*, E. Cinquanta, L. Ravagnan, I.E. Castelli, F. Cataldo, N. Manini, G. Onida, and P. Milani, J. Chem. Phys. **135**, 194501 (2011).
62. *Crossover from adiabatic to antiadiabatic quantum pumping with dissipation*, F. Pellegrini, C. Negri, F. Pistolesi, N. Manini, G.E. Santoro, and E. Tosatti, Phys. Rev. Lett. **107**, 060401 (2011).
61. *Crystalline misfit-angle implications for solid sliding*, N. Manini and O.M. Braun, Phys. Lett. A **375**, 2946 (2011).
60. *Dependence of boundary lubrication on the misfit angle between the sliding surfaces*, O.M. Braun and N. Manini, Phys. Rev. E **83**, 021601 (2011); a figure was selected for <http://pre.aps.org/kaleidoscope/February2011>
59. *Synthesis, Characterization, and Modeling of Naphthyl-Terminated sp Carbon Chains: Dinaphthylpolyynes*, F. Cataldo, L. Ravagnan, E. Cinquanta, I.E. Castelli, N. Manini, G. Onida, and P. Milani, J. Phys. Chem. B **114**, 14834 (2010).
58. *Ab initio intraband contributions to the optical properties of metals*, M. Cazzaniga, L. Caramella, N. Manini, and G. Onida, Phys. Rev. B **82**, 035104 (2010).
57. *Vibrational properties of sp carbon atomic wires in cluster-deposited carbon films*, G. Onida, N. Manini, L. Ravagnan, E. Cinquanta, D. Sangalli, and P. Milani, Phys. Status Solidi B **247**, 2017 (2010).
56. *Comment to 'Imaging the atomic orbitals of carbon atomic chains with field-emission electron microscopy'*, N. Manini and G. Onida, Phys. Rev. B **81**, 127401 (2010).
55. *AFM dissipation topography and hysteretic phenomena at adsorbed overlayers*, C. Negri, N. Manini, A. Vanossi, G.E. Santoro, and E. Tosatti, Phys. Rev. B **81**, 045417 (2010).
54. *Mesophases in nearly-2D room-temperature ionic liquids*, N. Manini, M. Cesaratto, M. G. Del Popolo, and P. Ballone, J. Phys. Chem. B **113**, 15602 (2009).
53. *Tribology of the lubricant quantized-sliding state*, I.E. Castelli, R. Capozza, A. Vanossi, G.E. Santoro, N. Manini, and E. Tosatti, J. Chem. Phys. **131**, 174711 (2009).
52. *Atomistic simulations of the sliding friction of graphene flakes*, F. Bonelli, N. Manini, E.

- Cadelano, and L. Colombo, Eur. Phys. J. B **70**, 449 (2009).
51. *Effect of Axial Torsion on sp Carbon Atomic Wires*, L. Ravagnan, N. Manini, E. Cinquanta, G. Onida, D. Sangalli, C. Motta, M. Devetta, A. Bordoni, P. Piseri, and P. Milani, Phys. Rev. Lett. **102**, 245502 (2009); selected for Volume 19 Issue 26 of Virtual Journal of Nanoscale Science & Technology.
 50. *Algebraic-matrix calculation of vibrational levels of triatomic molecules*, T. Sedivcova, Hewa Y. Abdullah, and N. Manini, J. Phys. Chem. A **113**, 6142 (2009).
 49. *DC and AC Josephson effects with superfluid Fermi atoms across a Feshbach resonance*, L. Salasnich, F. Ancilotto, N. Manini, and F. Toigo, Laser Phys. **19**, 636 (2009).
 48. *The role of lubricant molecular shape in microscopic friction*, O. M. Braun, N. Manini, and E. Tosatti, Phys. Rev. B **78**, 195402 (2008).
 47. *Role of transverse displacements for a quantized-velocity state of the lubricant*, I.E. Castelli, N. Manini, R. Capozza, A. Vanossi, G.E. Santoro, and E. Tosatti, J. Phys.: Condens. Matter **20**, 354005 (2008).
 46. *Nonlinear hysteretic behavior of a confined sliding layer*, N. Manini, G.E. Santoro, E. Tosatti, and A. Vanossi, J. Phys.: Condens. Matter **20**, 224020 (2008).
 45. *Lubricated friction between incommensurate substrates*, A. Vanossi, G.E. Santoro, N. Manini, E. Tosatti, and O. M. Braun, Tribol. Int. **41**, 920 (2008).
 44. *Macroscopic periodic tunneling of Fermi atoms in the BCS-BEC crossover*, L. Salasnich, N. Manini and F. Toigo, Phys. Rev. A **77**, 043609 (2008).
 43. *Ab initio self-energy corrections in systems with metallic screening*, M. Cazzaniga, N. Manini, L. G. Molinari, and G. Onida, Phys. Rev. B **77**, 035117 (2008).
 42. *An optimized algebraic basis for molecular potentials*, A. Bordoni and N. Manini, J. Phys. Chem. A **111**, 12564 (2007).
 41. *Static friction on the fly: velocity depinning transitions of lubricants in motion*, A. Vanossi, N. Manini, F. Caruso, G.E. Santoro, and E. Tosatti, Phys. Rev. Lett. **99**, 206101 (2007); selected for Volume 16 Issue 22 of Virtual Journal of Nanoscale Science & Technology.
 40. *Dynamic hysteresis of a confined lubricant under shear*, N. Manini, A. Vanossi, G.E. Santoro, and E. Tosatti, Phys. Rev. E **76**, 046603 (2007).
 39. *Kink plateau dynamics in finite-size lubricant chains*, M. Cesaratto, N. Manini, A. Vanossi, E. Tosatti, and G.E. Santoro, Surf. Sci. **601**, 3682 (2007).
 38. *Hysteresis from dynamically pinned sliding states*, A. Vanossi, G.E. Santoro, N. Manini, M. Cesaratto, and E. Tosatti, Surf. Sci. **601**, 3670 (2007).
 37. *Solitons and exact velocity quantization of incommensurate sliders*, N. Manini, M. Cesaratto, G.E. Santoro, E. Tosatti, and A. Vanossi, J. Phys.: Condens. Matter **19**, 305016 (2007).
 36. *Self-induced density modulations in the free expansion of Bose-Einstein condensates*, L. Salasnich, N. Manini, F. Bonelli, M. Korbman, and A. Parola, Phys. Rev. A **75**, 043616 (2007).
 35. *Mean-Field vs. Monte Carlo Equation of State for the Expansion of a Fermi Superfluid in the BCS-BEC Crossover*, L. Salasnich and N. Manini, Laser Phys. **17**, 169 (2007).
 34. *Systematic calculation of molecular vibrational spectra through a complete Morse expansion*, A. Bordoni and N. Manini, Int. J. Quantum Chem. **107**, 782 (2006).

33. *Exactly quantized dynamics of classical incommensurate sliders*, A. Vanossi, N. Manini, G. Divitini, G.E. Santoro, and E. Tosatti, Phys. Rev. Lett. **97**, 056101 (2006); selected for Volume 14 Issue 7 of Virtual Journal of Nanoscale Science & Technology.
32. *Asymmetric frictional sliding between incommensurate surfaces*, G.E. Santoro, A. Vanossi, N. Manini, G. Divitini, and E. Tosatti, Surf. Sci. **600**, 2726 (2006).
31. *Expansion of a Fermi Cloud in the BCS-BEC Crossover*, G. Diana, N. Manini, and L. Salasnich, Phys. Rev. A **73**, 065601 (2006).
30. *Enumeration of many-body skeleton diagrams*, L. G. Molinari and N. Manini, Eur. Phys. J. B **51**, 331 (2006).
29. *Condensate fraction of a Fermi gas in the BCS-BEC crossover*, L. Salasnich, N. Manini, and A. Parola, Phys. Rev. A **72**, 023621 (2005).
28. *Bulk and collective properties of a dilute Fermi gas in the BCS-BEC crossover*, N. Manini and L. Salasnich, Phys. Rev. A **71**, 033625 (2005).
27. *Low-energy excitations of a linearly Jahn-Teller coupled orbital quintet*, N. Manini, Phys. Rev. A **71**, 032503 (2005).
26. *Low-energy unphysical saddle in polynomial molecular potentials*, A. Del Monte, N. Manini, L.G. Molinari, and G.P. Brivio, Mol. Phys. **103**, 689 (2005).
25. *Jahn-Teller Spectral Fingerprint in Molecular Photoemission: C_{60}* , N. Manini, P. Gattari, and E. Tosatti, Phys. Rev. Lett. **91**, 196402 (2003); selected for Volume 8 Issue 20 of Virtual Journal of Nanoscale Science & Technology.
24. *Hund's rule Magnetism in C_{60} ions?*, M. Lueders, N. Manini, P. Gattari, and E. Tosatti, Eur. Phys. J. B **35**, 57 (2003).
23. *Comment to 'Experimental Evidence of a Dynamic Jahn-Teller Effect in C_{60}^+ '*, N. Manini and E. Tosatti, Phys. Rev. Lett. **90**, 249601 (2003).
22. *Coulomb couplings in positively charged fullerene*, M. Lueders, A. Bordoni, N. Manini, A. Dal Corso, M. Fabrizio, and E. Tosatti, Philos. Mag. B **82**, 1611 (2002).
21. *Sensitivity of the Mott transition to noncubic splitting of the orbital degeneracy: Application to $NH_3 K_3 C_{60}$* , N. Manini, G.E. Santoro, A. Dal Corso, and E. Tosatti, Phys. Rev. B **66**, 115107 (2002).
20. *Observation of off-diagonal geometric phase in polarized neutron interferometer experiments*, Y. Hasegawa, R. Loidl, G. Badurek, M. Baron, N. Manini, F. Pistolesi, and H. Rauch, Phys. Rev. A **65**, 052111 (2002).
19. *Low-Energy Scales and Temperature-Dependent Photoemission of Heavy Fermions*, T.A. Costi and N. Manini, J. Low Temp. Phys. **126**, 835 (2002).
18. *Electron-vibration coupling constants in positively charged fullerene*, N. Manini, A. Dal Corso, M. Fabrizio, and E. Tosatti, Philos. Mag. B **81**, 793 (2001).
17. *Off-Diagonal Geometric Phases*, N. Manini and F. Pistolesi, Phys. Rev. Lett. **85**, 3067 (2000).
16. *Geometric Phases and Multiple Degeneracies in Harmonic Resonators*, F. Pistolesi and N. Manini, Phys. Rev. Lett. **85**, 1585 (2000).
15. *Berry phase and ground-state symmetry in $H \otimes h$ dynamical Jahn-Teller systems*, N. Manini and P. De Los Rios, Phys. Rev. B **62**, 29 (2000).
14. *The role of the Berry Phase in Dynamical Jahn-Teller Systems*, N. Manini and P. De

Los Rios, J. Phys.: Condens. Matter **10**, 8485 (1998).

13. *Exact zero-point energy shift in the $e \otimes (n E)$, $t \otimes (n H)$ many modes dynamic Jahn-Teller systems at strong coupling*, N. Manini and E. Tosatti, Phys. Rev. B **58**, 782 (1998).

12. *Comment on 'Spin Polarization and Magnetic Circular Dichroism in Photoemission from the 2p Core Level of Ferromagnetic Ni'*, N. Manini, M. van Veenendaal, and M. Altarelli, Phys. Rev. Lett. **79**, 2594 (1997).

11. *Surprises in the Orbital Magnetic Moment and g-Factor of the Dynamic Jahn-Teller Ion C_{60}^-* , E. Tosatti, N. Manini, and O. Gunnarsson, Phys. Rev. B **54**, 17184 (1996).

10. *Dynamical Jahn-Teller effect and Berry phase in positively charged fullerenes: Basic considerations*, P. De Los Rios, N. Manini, and E. Tosatti, Phys. Rev. B **54**, 7157 (1996).

9. *Phase Diagram of a Model of Correlated Electrons in a Lattice of Berry Molecules*, G. Santoro, N. Manini, A. Parola, and E. Tosatti, Phys. Rev. B **53**, 828 (1996).

8. *Phase Diagram of Correlated Electrons in a Lattice of Berry Phase Molecules*, G. Santoro, M. Airoidi, N. Manini, E. Tosatti, and A. Parola, Phys. Rev. Lett. **74**, 4039 (1995).

7. *Enhanced Electron Pairing in a Lattice of Berry Phase Molecules*, N. Manini, E. Tosatti, and S. Doniach, Phys. Rev. B **51**, 3731 (1995).

6. *A simple approach to correlation of rotovibrational levels of four-atomic molecules*, N. Manini and S. Oss, Z. Phys. D **32**, 85 (1994).

5. *Anomalous attachment of low-energy electrons to C_{60}* , E. Tosatti and N. Manini, Chem. Phys. Lett. **223**, 61 (1994).

4. *Electron-vibron interactions in charged fullerenes. II. Pair energies and spectra*, N. Manini, E. Tosatti, and A. Auerbach, Phys. Rev. B **49**, 13008 (1994).

3. *Electron-vibron interactions in charged fullerenes. I. Berry phases*, A. Auerbach, N. Manini, and E. Tosatti, Phys. Rev. B **49**, 12998 (1994).

2. *VIBR3AT: a computer program for triatomic molecular spectroscopy in an algebraic approach*, S. Oss, N. Manini, and R. Lemus Casillas, Comp. Phys. Comm. **74**, 164 (1993).

1. *Quasi-linear four-atomic molecules in the vibron model*, F. Iachello, N. Manini, and S. Oss, J. Mol. Spectrosc. **156**, 190 (1992).

Scientific books and book chapters

3. *Jahn-Teller and Coulomb correlations in fullerene ions and compounds. From isolated ions to metal, insulator, and superconductor phases of alkali fulleride solids*, N. Manini and E. Tosatti, (Lambert Acad. Publ., Saarbrucken, 2010), ISBN: 978-3-8383-6024-9

2. *Theoretical aspects of highly correlated fullerenes: metal-insulator transition*, N. Manini and E. Tosatti, *Fullerene-Related Materials*, ed. S. Margadonna (Springer 2011) ISBN: 978-1402044588, Chap. 6; cond-mat/0602134.

1. *Introduction to the Physics of Matter*, N. Manini (CUSL Milano, 2007, 5th ed.: 2011) ISBN: 88-8132-639-6.

Conferences, workshops, and publications in proceedings

NM delivered a total of 17 invited talks, plus several contributed talks and posters at the following international conferences:

CECAM workshop on Quantum Monte Carlo for atoms, molecules and selected condensed matter systems, Orsay (Paris), France, June 12-20, 1990

Roto-vibrational spectroscopy of quadriatomic molecules: an algebraic approach,
S. Oss, N. Manini, and L. Viola

published in

Proceedings of SASP 92 - Symposium on Atomic and Surface Physics (Pampeago, Italy, Jan. 19-25, 1992) p. 2.120. edited by D.Bassi, M.Scotoni and P.Tosi

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presented at

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Berry phases and Superconductivity in ionic C_{60} -based materials,
poster presented at

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VII International Workshop on Computational Condensed Matter Physics: Total Energy and Force Methods, I.C.T.P., Trieste, Italy, Jan. 11-15, 1995

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187th Meeting of The Electrochemical Society, Inc., Reno, NV, U.S.A., May 21-26, 1995

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 C_{60}^- ,
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International Society of Electrochemistry, Paris, France, Aug. 31 - Sep. 5, 1997

Highlights in X-Ray Synchrotron Radiation Research, Grenoble, France, Nov. 17-20, 1997

Fullerene ions: many-modes dynamic Jahn-Teller systems at strong coupling,
poster presented at
INFMeeting - Congresso Nazionale di Fisica della Materia, Rimini, Italy, June 25-30, 1998

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Teller Systems*, N. Manini and P. De Los Rios

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Proceedings of the *XIV International Symposium on Electron-Phonon Dynamics and Jahn-
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(World Scientific Publishing Co. Pte. Ltd, Singapore, 1999), p. 37. (invited talk)

SRRTNET Workshop '99 Workshop on Theory and Computation for Synchrotron Radi-
ation Frascati, Italy, Sep. 23-25, 1999

Computational Quantum Many-Body Physics, Newton Institute - Cambridge UK Feb.
18-21, 2000

Which ground state for C_{60}^+ ?,
poster presented at
XIV International Winterschool - Euroconference on Electronic properties of novel materials
- molecular nanostructures, Kirchberg/Tirol Austria Mar. 4-11, 2000

Electron-vibration couplings in positive C_{60}^+ ions,
poster presented at
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ods, I.C.T.P., Trieste, Italy, Jan. 11-13, 2001

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poster presented at

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Electron-vibration couplings in positively charged fullerene,
presented at

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Accoppiamenti elettrone-vibrazione in fullerene caricato positivamente,
invited talk at

LXXXVII Congresso Nazionale Società Italiana di Fisica, Milano - Bicocca, Sep. 24-29, 2001

Coulomb couplings in positively charged fullerene,
poster presented at

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Jahn-Teller Distortions and Excitation Energies in C_{60}^{n+} , M. Lueders and N. Manini,

published in

Adv. Quantum Chem. 44, ed. A. Ceulemans, L. Chibotaru, and E. Kryachko (Elsevier, Berlin 2003), p. 289.

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XVI Jahn-Teller Conference, Catholic University of Leuven-Belgium, Aug. 26 - Sep. 1, 2002.

Coulomb couplings in positively charged fullerene,
presented at

Euroconference CMS2002 - XII Workshop on Computational Materials Science, Villasimius (CA)-Italy, Sep. 23-29, 2002

Sensitivity of the Mott transition to noncubic splitting of the orbital degeneracy: Application to $NH_3 K_3 C_{60}$,

invited talk at

203rd Meeting of The Electrochemical Society, Paris, France, Apr. 27 - May 2, 2003

Hund Rule Magnetism in C_{60} Ions and Calculation of the Photoemission Spectrum of Gas-Phase C_{60} , posters presented at INFMeeting - National Conference on Physics of Matter, Genova, Italy, June 23-25, 2003

Sensitivity of the Mott transition to noncubic splitting of the orbital degeneracy: Application to $NH_3 K_3 C_{60}$,

invited talk at

Workshop on Electronic Properties of Organic Semiconductors, Leiden, The Netherlands, Jul. 7-11, 2003

Jahn-Teller Spectral Fingerprint in Molecular Photoemission: C_{60} ,
presented at

Euroconference CMS2003 - XIII Workshop on Computational Materials Science, Geremeas (CA)-Italy, Sep. 13-18, 2003

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A. Bordoni and N. Manini

published in

Fullerenes and Nanotubes - Materials for the New Chemical Frontier - Fullerenes - Vol. 14,

edited by P. V. Kamat, F. D'Souza, D. M. Guldi, and S. Fukuzumi (The Electrochemical Society, Pennington, NJ, 2005), p. 118.

invited talk at

205rd Meeting of The Electrochemical Society, San Antonio, TX, USA, May 9 - 13, 2004

Hund's Rule Magnetism in C_{60} Ions?,

poster presented at

INFMeeting - National Conference on Physics of Matter (CNR-INFM), Genova, Italy, June 8-10, 2003

Workshop on Novel States and Phase Transitions in Highly Correlated Matter, I.C.T.P., Trieste, Italy, July 12-23, 2004

20th General Conference Condensed Matter Division EPS, Prague, Czech Republic, July 19-23, 2004

Jahn-Teller Spectral Fingerprint in Molecular Photoemission: C_{60} ,

invited talk at

International workshop on Jahn-Teller Effect, Beijing, China, Aug. 24-26, 2004

Off-diagonal geometric phases,

invited talk at

School and Workshop on Quantum Entanglement, Decoherence, Information, and Geometrical Phases in Complex Systems, I.C.T.P., Trieste, Italy Nov. 01-12, 2004

Jahn-Teller Spectral Fingerprint in Molecular Photoemission: C_{60} ,

invited talk at

XII International Workshop on Computational Condensed Matter Physics and Materials Science: Total Energy and Force Methods, I.C.T.P., Trieste, Italy, Jan. 13-15, 2005

Many-body Properties of a Jellium Slab,

presented at

40 Years of the GW Approximation for the Electronic Self-Energy: Achievements and Challenges, Bad Honnef, Germany, Sep. 12-15, 2005

Condensate Fraction of a Fermi Gas in the BCS-BEC Crossover,

poster presented at

Highlights in Physics 2005, Milano, Italy, Oct. 11-14, 2005

Exact velocity quantization phenomena in the lubricated friction of classic periodic sliders,
presented at

12th Workshop On Surface Dynamics, Modena, Italy, June 22-25, 2006

Nanotribology and lubrication at the atomic scale,

invited talk at

International School of Solid State Physics - 37th workshop: low-dimensional phenomena and simulations, Erice, Italy, July 26-31, 2006

Linear Jahn-Teller effect of an orbital quintet in icosahedral symmetry,

presented at

International Symposium on the Jahn-Teller Effects: Novel Aspects in Orbital Physics and Vibronic Dynamics of Molecules and Crystals, Trieste, Italy, Aug. 28-31, 2006.

Hund's Rule Magnetism in C_{60} Ions?,

poster presented at

Theoretical Concepts on Magnetism in Solids - Symposium in Memoriam of Paolo Carra, Grenoble, France, Sep. 14-15, 2006

Exactly quantized dynamics of classical incommensurate sliders,
presented at
XCII Congresso nazionale - Società Italiana di Fisica, Torino, Italy, Sep. 18-23, 2006

Static friction on the fly: velocity pinning transitions of lubricants in motion,
poster presented at
Statphys 23, Genova, Italy, July 9-13, 2007

Static friction on the fly: velocity pinning transitions of lubricants in motion,
invited talk at
Vibrations at Surfaces 12, Erice, Italy, July 20-26, 2007

12th Nanoquanta Workshop on Electronic Excitations, Aussois, France, Sep. 18-22, 2007

Quantized lubricant velocity in a bi-dimensional sliding model,
invited talk at
CECAM workshop: Modelling and simulations of friction at the nanoscale: from understanding to control, Lyon, France, Nov. 08-10, 2007

The role of lubricant molecular shape in microscopic friction,
invited talk at
International School of Solid State Physics - 44th workshop: Dynamical Phenomena in low-Dimensional Systems, Erice, Italy, July 20-26, 2008

Hund's Rule Magnetism in C₆₀ Ions?,
poster presented at
XIX International Symposium on the Jahn-Teller Effect: Vibronic Interactions and Orbital Physics in Molecules and in the Condensed Phase, Heidelberg, Germany, Aug. 25-29, 2008

13th Nanoquanta-ETSF Workshop on Electronic Excitations, Pugnochiuso, Italy, Sep. 22-27, 2008

The role of lubricant molecular shape in microscopic friction,
presented at
Physics of Tribology - Understanding Friction and Wear processes in technical systems, Bad Honnef, Germany, March 22-25, 2009

Computer simulation of 2D mesophases of 1,3-dialkylimidazolium ionic liquid films,
presented at
CECAM workshop: Computational models of room temperature ionic liquids, Dublin, Ireland, April 6-8, 2009

Theory of AFM frictional dissipation at surface Moire patterns,
presented at
2nd South-East European Conference on Computational Mechanics (SEECCM 2009), Rhodes, Greece, June 22-24, 2009

Theory of AFM frictional dissipation at surface Moire patterns,
presented at
ECOSS 26, European Conference on Surface Science, Parma, Italy, Aug. 30 - Sep. 04, 2009

Joint ICTP/FANAS Conference on Trends in Nanotribology Trieste, Oct. 19-24, 2009

Tribology of the lubricant quantized sliding state,
invited talk at
ACAM- SFI SimBioMa-ESF Workshop: Molecular Friction Dublin, Ireland, Dec. 14-16, 2009

Theory of AFM frictional dissipation at surface Moire patterns,

presented at
Transalp'Nano 2010, The Second Transalpine Conference on Nanoscience and Nanotechnologies Como, Italy, June 3 - 5, 2010.

Theory of AFM frictional dissipation at surface Moire patterns,
presented at
ECOSS 27, European Conference on Surface Science, Groningen, The Netherlands, Aug. 29 - Sept. 3, 2010.

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poster presented at
IOM-CNR Workshop, Trieste, Italy, Sep. 30 - Oct. 1, 2010.

Molecular Photoemission from C₆₀: The Clear Spectral Fingerprint of Jahn-Teller Effect,
invited talk at
Fullerene Silver Aniversary Symposium, FSAS-2010 Hersonissos, Crete, Greece, Oct. 4-10, 2010.

Comment to "Imaging the atomic orbitals of carbon atomic chains with field-emission electron microscopy",
poster presented at
15th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods I.C.T.P., Trieste, Italy, Jan. 13-15, 2011

Theory of AFM frictional dissipation at surface Moire patterns,
presented at
International Nanotribology Forum: The Hoi An Discussions Hoi An, Vietnam, May 23-27, 2011

Electronic and mechanical properties of sp carbon atomic nanowires,
presented at
16th ETSF Workshop on Electronic Excitations - Bridging theory and experiment Torino, Italy, Sept. 27-30, 2011

NOTE: most of NM's publications (including preprints and obscure conference proceedings) are available at http://arXiv.org/find/cond-mat/1/au:+manini_n/0/1/0/all/0/1

Scientific non-peer reviewed publications

Black-Body extrapolation of Infrared Irradiance for occupational risk assessment, G. Pungillo, N. Manini, and F. Frigerio, Ital. J. Occup. Environ. Hyg. **2**, 25 (2011). <http://www.ijoehy.it/>

Off-diagonal geometric phases, F. Pistolesi and N. Manini, ILL Annual Report 2000, p. 76, http://www.ill.eu/fileadmin/users_files/Annual_Report/AR-00/p-76.htm

Berry's geometric phase: a review, N. Manini, <http://www.mi.infm.it/manini/berryphase.html> (1999).

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References

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