Research Table

Riccardo Fantoni[a)]
Dipartimento di Scienze Molecolari e Nanosistemi, Università Ca' Foscari Venezia, Calle Larga S. Marta DD2137, I-30123 Venezia, Italy

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TABLE I. Scheme of the Research Work (1995-2023)

	Statistical Physics of Classical and Quantum Fluids		
	Classical Fluids (Soft-Matter)		Quantum Fluids (Condensed-Matter)
	Exact Analytical Solutions	Exact Numerical Solutions and Theoretical Approximations	Exact Numerical Solutions and Theoretical Approximations
Fluid Models	1D nearest neighbor fluids [16,21,22] (HS, SHS, SW, PSW), 1D second nearest neighbor fluids [55], 1D thorugh functional integration [51], 1D with positive potentials [52], 1D OCP [17, 51], 2D OCP (in a plane [1], a pseudosphere [4,32,61], a Flamm's paraboloid [17,32,61]), 2D TCP (in a Flamm's paraboloid [29,61]), 3D OCP [62], 3D TCP [49,53]	Isotropic pair interaction (HS [6,8], SHS [9,11,54], PSW [18,20,21,22,24,25], LJ [5]), Anisotropic pair interaction (Janus SHS [69], Janus SW [23,28], Patchy (SHS [14,15,19], Kern-Frenkel [42], SW [45]), Binary mixture (HS [8], SHS [10], NAHS (homogeneous [7,8,27] and inhomogeneous [37,41], NASHS [46]), Janus SHS [36,40], RPM [35,38]), Square-Shoulder-Asakura-Oosawa [50], Polydisperse fluids (SHS) [9,12,13], Colloidosome [30], Polymer [26]	Jellium in 1D 2D 3D ground state [2,3,34,39,56] and at finite temperature [57, 64,70], Acoustic Polaron at finite temperature [31,33], Boson SW at finite temperature [43, 48], SHS [57], ^{4}He in 2D and in 3D at finite temperature[43,44], Hydrogen-Helium mixture at finite temperature[47], electron plasma at finite temperature on a sphere [58], anyons [63]
Properties	Partition Function (canonical and grand canonical), $n-$body correlation functions, Pressure, Sum Rules	One-body density, RDF, Structure Factor, Direct Correlation Function, Bridge Function, Binodal, Spinodal, Demixing coexistence, Percolation threshold, Clustering, Internal Energy, Pressure, Chemical Potential, Virial Coefficients, Depletion Force	RDF, Structure Factor, Binodal, Internal Energy, Pressure, Superfluid fraction
Numerical Methods		(N,V,T) MC, (N,P,T) MC, (μ,V,T) MC, GEMC - Solution of Ornstein-Zernike equation (Zerah algorithm)	Variational MC, Diffusion MC, PIMC (conventional and worm algorithm), QGEMC
Theoretical Methods	Riemannian geometry, Vandermonde determinant, Cauchy identities, Grassman variables, asymptotic analysis	Ruelle stability, Integral Equation Theories (BGY, PY, RFA, HNC, RY, (M)V, MS, BPGG, (L)DH, (M)MSA, RPA), Thermodynamic Perturbation Theories (WCA), Cluster Theories, Mayer expansions, Linear Response Theory, , Out of equilibrium [60]	Variational Method, RPA, Linear Response Theory, Affine quantization of Scalar, Euclidean Covariant and Ultralocal field theory [65,66,67,68,71,72,73,74]

a)Electronic mail: riccardo.fantoni@posta.istruzione.it

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TABLE II. Scientific Collaborations (1995-2023)

Collaborator	# of Publications
Mario Pio Tosi, Scuola Normale Superiore (SNS) of Pisa, Italy	3
Bernard Jancovici, University of Paris-Sud at Orsay, France	1
Gabriel Téllez, University of Los-Andes in Bogotà, Colombia	2
Angel Alastuey, Ecole Normale Supérieure de Lyon, France	1
Giorgio Pastore, University of Trieste, Italy	10
Domenico Gazzillo, University “Ca’ Foscari” of Venice, Italy	8
Achille Giacometti, University “Ca’ Foscari” of Venice, Italy	19
Andrés Santos, University of Extremadura at Badajoz, Spain	13
Francesco Sciortino, University “La Sapienza” of Rome, Italy	1
Peter Sollich, King’s college of London, United Kingdom	2
Mark Miller, University of Cambridge, United Kingdom	1
Alexandr Malijevský, University of Prague, Czech Republic	4
Kristian Müller-Nedebock, University of Stellenbosch, South Africa	1
Bert Klumperman, University of Stellenbosch, South Africa	1
Johannes Salari, University of Technology Eindhoven, The Netherlands	1
Miguel Angel Maestre, University of Extremadura at Badajoz, Spain	3
Saverio Moroni, CNR Rome-Trieste, Italy	1
John Klauder, University of Florida, U.S.A.	7