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**Coordinator of the COAST project (Saclay) and the HP2C program “Cosmology at the Petascale” (Zürich)
 Professor at the University of Zürich**

EDUCATION

1989-1992: Ecole Polytechnique, Palaiseau, France.
1992-1994: Ecole Nationale Supérieure des Techniques Avancées, Paris, France.
1992-1993: Master in “Astrophysics and Space Science”, University Paris VII, France.
1993-1996: PhD in “Astrophysics and Space Science”, University Paris VII, France.
2007: Thesis for “Habilitation to direct research activities”, University Paris VII, France.

RESEARCH INTERESTS

Astrophysicist in CEA Saclay since 1997 at the Research Institute onto the Fundamental Laws of the Universe, a joint Particle Physics and Astrophysics department in Saclay. Expert in galaxy formation and astrophysical plasma physics. Expert in computational physics (N body and Magneto-Hydrodynamics, Adaptive Mesh Refinement techniques, High Performance Computing with massively parallel applications). Principal Investigator of the Horizon project. Principal Investigator of the HP2C project “Cosmology at the Petascale”. Professor at the University of Zürich since 2008.

ACTIVITIES

1998: Post-doc at Lawrence Livermore National Laboratory with Bruce Remington
1999-2001: Co-investigator of the “Astrolab” experiment on the Phebus laser.
1999-2005: Co-investigator of the Planck Surveyor space mission.
2000-present: Author of the RAMSES code: self-gravity and fluid dynamics with AMR
2003-2008: Principal Investigator of the Horizon Project.
2004-present: Head of the Computational Astrophysics group in Saclay: <http://irfu.cea.fr/Projets/COAST>.
2009-present: Coordinator with George Lake of the HP2C funded project “Cosmology at the Petascale”.

GRANTS

2001-2008: The Horizon project funded by ANR in France (1 M€)
2005-2010: The ASTROSIM network funded by ESF (French budget 150 k€)
2010-2014: The CosmoComp network funded by EEC (French budget 500 k€)
2010-2014: HP2C project “Cosmology on the Petascale” (1.1 MCHF)
2012-2015: “From Stars to Galaxies” funded by Cino and Simone Del Duca Foundation (400 k€)

AWARDS

2011: Grand Prix scientifique Simone & Cino Del Duca, awarded by the French Academy of Science

TEACHING ACTIVITIES

2001-2008: “Computational Fluid Dynamics” at the University Paris VII.
2003: 42nd CEA-EDF-INRIA Summer School.
2004-2006: “Astrophysical Plasmas” at the University Paris XI.
2004: 7th Luminy Cosmology Summer School.
2006: LXXXVI Session of Les Houches Summer School on Particle Physics and Cosmology.
2008: 5th JETSET School on “High Performance Computing in Astrophysics”, Galway, Ireland
2008: “Supercomputing and Numerical Techniques in Astrophysics”, Evora, Portugal
2009: “Computational Astrophysics Advanced Lectures”, Universität Zürich and ETHZ.
2009: “Supercomputing and Numerical Techniques in Astrophysics”, Evora, Portugal
2010: ASTROSIM Summer School on Computational Astrophysics, Torun, Poland
2011: “Continuum Mechanics Lectures”, Universität Zürich and ETHZ.

PHD STUDENTS

2002-2005: Yann Rasera, PhD thesis defended 13/10/2005: “Baryons in a Hierarchical Universe”

2005-2008: Yohan Dubois, PhD thesis defended 30/09/2008: “Cosmological Evolution of the Magnetic Field”

2007-2010: Thomas Guillet, PhD thesis defended 31/09/2010: “Baryons and structure formation”

2008-2011: Damien Chapon, PhD thesis to be defended in Sept. 2011.

2009-2012: Davide Martizzi, Christine Corbett, Andreas Bleuler, Sarah Nickerson

84 PUBLICATIONS IN REFEREED JOURNALS WITH 2500 CITATIONS (SOURCE ADS)

2011

1. Dubois, Y., Devriendt, J., Teyssier, R., Slyz, A., « How AGN feedback and metal cooling shape cluster entropy profiles», 2011, in press
2. House, E., *et al.*, « Disc Heating: Comparing the Milky Way with Cosmological Simulations», 2011, in press
3. Schaerer, D., Hayes, M., Verhamme, A., Teyssier, R., « Grid of Ly α radiation transfer models for the interpretation of distant galaxies», 2011, in press
4. Kritsuk, A., *et al.*, « Comparing Numerical Methods for Isothermal Magnetized Supersonic Turbulence», 2011, ApJ, in press
5. Guillet, T., Teyssier, R., « A simple multigrid scheme for solving the Poisson equation with arbitrary domain boundaries», 2011, JCP, 230, 4756
6. Teyssier, R., Moore, B., Martizzi, D., Dubois, Y., Mayer, L., « Mass Distribution in Galaxy Clusters: the Role of AGN Feedback», 2011, MNRAS, in press
7. Commerçon, B., Teyssier, R., Audit, E., Hennebelle, P., Chabrier, G., « Radiation hydrodynamics with adaptive mesh refinement and application to prestellar core collapse. I. Methods», 2011, A&A, 529, 35
8. Hennebelle, P., Commerçon, B., Joos, M., Klessen, R. S., Krumholz, M., Tan, J. C., Teyssier, R., « Collapse, outflows and fragmentation of massive, turbulent and magnetized prestellar barotropic cores», 2011, A&A, in press
9. Bournaud, F., Chapon, D., Teyssier, R., Powell, L. C. *et al.*, « Hydrodynamics of High-redshift Galaxy Collisions: From Gas-rich Disks to Dispersion-dominated Mergers and Compact Spheroids», 2011, ApJ, 730, 4
10. Agertz, O., Teyssier, R., Moore, B., « The formation of disk galaxies in a LCDM universe», 2011, MNRAS, 410, 1391

2010

11. Bournaud, F., Elmegreen, B.G., Teyssier, R., Block, D.L., Puerari, T., « ISM properties in hydrodynamic galaxy simulations: Turbulence cascades, cloud formation, role of gravity and feedback», 2010, MNRAS, 409, 1088
12. Dubois, Y., Devriendt, J., Slyz, A., Teyssier, R., « Jet-regulated cooling catastrophe», 2010, MNRAS, 409, 985
13. Aubert, D., Teyssier, R., « Reionization Simulations Powered by Graphics Processing Units. I. On the Structure of the Ultraviolet Radiation Field», 2010, ApJ, 724, 244
14. Dubois, Y., Teyssier, R., « Magnetic field in dwarf galaxies: building block for a Cosmic Dynamo», 2010, A&A, 523, 72
15. Goerdt, T., Dekel, A., Sternberg, A., Ceverino, D., Teyssier, R., & Primack, J. R., « Gravity-driven Ly α blobs from cold streams into galaxies», 2010, MNRAS, 407, 613
16. Teyssier, R., Chapon, D., & Bournaud, F., « The driving mechanism of starbursts in galaxy mergers», 2010, ApJ Letter, 720, 149
17. Pato, M., Agertz, O., Bertone, G., Moore, B., & Teyssier, R., « Systematic uncertainties in the determination of the local dark matter density», 2010, PRD, 82, 023531
18. Guillet, T., Teyssier, R., Colombi, S., « The effect of baryons on the variance and the skewness of the mass distribution in the Universe at small scales», 2010, MNRAS, 405, 525
19. Frascchetti, F., Teyssier, R., Ballet, J., Decourchelle, A., « Simulation of the growth of the 3D Rayleigh-Taylor instability in supernova remnants using an expanding reference frame», 2010, A&A, 515, 104

20. Hahn, O., Teyssier, R., Carollo, M., « The large-scale orientations of disc galaxies », 2010, MNRAS, 405, 274
21. Gay, C., Pichon, C., Le Borgne, D., Teyssier, R., Sousbie, T., Devriendt, J., « On the filamentary environment of galaxies », 2010, MNRAS, 404, 1801
22. Devriendt, J., Rimes, C., Pichon, C., Teyssier, R., Le Borgne, D., Aubert, D., Audit, E., Colombi, S., Courty, S., Dubois, Y., « The dusty, albeit ultraviolet bright infancy of galaxies », 2010, MNRAS, 403, L83
23. Ling, F.-S., Nezri, E., Athanassoula, E., Teyssier, R., « Dark matter direct detection signals inferred from a cosmological N-body simulation with baryons », 2010, JCAP, 2, 12
24. Commerçon, B., Hennebelle, P., Audit, E., Chabrier, G., Teyssier, R., « Protostellar collapse: radiative and magnetic feedbacks on small scale fragmentation », 2010, A&A, 510, L3
25. Pichon, C., Thiébaud, E.; Prunet, S.; Benabed, K.; Colombi, S.; Sousbie, T.; Teyssier, R., « ASKI: full-sky lensing map making algorithms », 2010, MNRAS, 401, 705
26. Ferrand, G., Decourchelle, A., Ballet, J., Teyssier, R., Frascchetti, F., « 3D simulations of supernova remnants evolution including non-linear particle acceleration », 2010, A&A, 509, L10

2009

27. Martig, M., Bournaud, F., Teyssier, R., Dekel, A., « Morphological Quenching of Star Formation: Making Early-Type Galaxies Red », 2009, ApJ, 707, 250
28. Boley, A. C., Lake, G., Read, J., Teyssier, R., « Globular Cluster Formation Within a Cosmological Context », 2009, ApJ, 706, 192
29. Pires, S., Starck, J.-L., Amara, A., Réfrégier, A., Teyssier, R., « Cosmological model discrimination with weak lensing », 2009, A&A, 505, 969
30. Agertz, O., Teyssier, R., Moore, B., « Disk formation and the origin of clumpy galaxies at high redshift », 2009, MNRAS, 397, 64
31. Pires, S., Starck, J.-L., Amara, A., Teyssier, R., Réfrégier, A., Fadili, J., « FAST STatistics for weak Lensing (FASTLens): fast method for weak lensing statistics and map making. » 2009, MNRAS, 395, 1265
32. Teyssier, R., Pires, S., Prunet, S., Aubert, D., Pichon, C., Amara, A., Benabed, K., Colombi, S., Refregier, A., Starck, J.-L., « Full-sky weak lensing simulation using 70 billion particles », 2009, A&A, 497, 33
33. Athanassoula, E., Ling, F.-S., Nezri, E., Teyssier, R., « Gamma ray and neutrinos fluxes from a cosmological dark matter simulation », 2009, APh, 31, 37
34. Gruszecki, M., Murawski, K., Fromang, S., Teyssier, R., « Vertical Oscillations of a Curved Coronal Slab in an Inhomogeneous Plasma », 2009, AcPPB, 40, 367
35. Dekel, A., *et al.*, « Cold streams in early massive hot haloes as the main mode of galaxy formation », 2009, Nature, 457, 451
36. Agertz, O., Lake, G., Teyssier, R., Moore, B., Mayer, L., Romeo, A. B. « Large-scale galactic turbulence: can self-gravity drive the observed HI velocity dispersions ? », 2009, MNRAS, 392, 294

2008

37. Lavalle, J., Nezri, E., Athanassoula, E., Ling, F.-S., Teyssier, R., « Antimatter cosmic rays from dark matter annihilation: First results from an N-body experiment », 2008, PhRvD, 78, 3526
38. Ocvirk, P., Teyssier, R., Pichon, C., « Bimodal gas accretion in the MareNostrum galaxy formation simulation », 2008, MNRAS, 390, 1326
39. Prunet, S., Pichon, C., Aubert, D., Pogosyan, D., Teyssier, R., Gottloeber, « Initial conditions for large scale cosmological simulations », 2008, ApJS, 178, 179
40. Aubert, D., Teyssier, R., « A radiative transfer scheme for cosmological reionization based on a local Eddington tensor. », 2008, MNRAS, 387, 295
41. Solovyeva, L., Anokhin, S., Feretti, L., Sauvageot, J.L., Teyssier, R., Giovannini, G., Govoni, F., Neumann, D., « The dynamical state of A548 from XMM-Newton data: X-ray-radio connection », 2007, A&A, 484, 621
42. Dubois, Y., Teyssier, R., « Cosmological MHD simulation of a cooling flow cluster », 2008, A&A, 482, L13
43. Commerçon, B., Hennebelle, P., Audit, E., Chabrier, G., Teyssier, R., « Protostellar collapse: a comparison between SPH and AMR calculations », 2008, A&A, 482, 371

44. Dubois, Y., Teyssier, R., « On the onset of galactic winds in quiescent star forming galaxies », 2008, *A&A*, 477, 79
45. Hennebelle, P., Teyssier, R., « Magnetic processes in a collapsing dense core. II Fragmentation. Is there a fragmentation crisis ? », 2008, *A&A*, 477, 25

2007

46. Solovyeva, L., Anokhin, S., Sauvageot, J.L., Teyssier, R., Neumann, D., « The distant galaxy cluster CL0016+16: X-ray analysis up to R200 », 2007, *A&A*, 476, 63
47. Agertz, O., *et al.* « Fundamental differences between SPH and grid methods », 2007, *MNRAS*, 380, 963
48. Pomarède, D., Audit, E., Teyssier, R., Theoris, B., « Visualization of large astrophysical simulations datasets », 2007, *CoPhC*, 177, 263
49. Teyssier, R., « The MareNostrum simulation », 2007, Invited Talk at ISC'07 Conference, Dresden.
50. Teyssier, R., « Higher-order Godunov schemes with constrained transport for astrophysical and geophysical MHD », 2007, *GAFD*, 101, Issue 3, 199.
51. Macías-Pérez, J. F. *et al.*, « Archeops in-flight performance, data processing, and map making », 2007, *A&A*, 467, 1313
52. Cattaneo, A., Teyssier, R., « AGN self-regulation in cooling flow clusters », 2007, *MNRAS*, 376, 1547
53. Colombi, S., Chodorowski, M.J., Teyssier, R., « Cosmic velocity-gravity relation in redshift space », 2007, *MNRAS*, 375, 348

2006

54. Teyssier, R., Fromang, S., Dormy, E., « Kinematic dynamos using constrained transport with high order Godunov schemes and adaptive mesh refinement », 2006, *JCP*, 218, 44
55. Caniou, Y., Caron, E.; Depardon, B.; Courtois, H.; Teyssier, R., « Cosmological simulations using grid middleware », 2007, In *Fourth High-Performance Grid Computing Workshop. HPGC'07*, IEEE
56. Fromang, S., Hennebelle, P., Teyssier, R., « A high order Godunov scheme with constrained transport and adaptive mesh refinement for astrophysical magnetohydrodynamics », 2006, *A&A*, 457, 371
57. Coppolani, F., Petitjean, P., Stoehr, F., Rollinde, E., Pichon, C., Colombi, S., Haehnelt, M. G., Carswell, B., Teyssier, R., « Transverse and longitudinal correlation functions in the intergalactic medium from 32 close pairs of high-redshift quasars », 2006, *MNRAS* 370, 1804
58. Rasera, Y., Teyssier, R., Sizun, P., Cassé, M., Fayet, P., Cordier, B., Paul J., « Soft gamma-ray background and light dark matter annihilation », 2006, *Phys. Rev. D*, 73, 351
59. Poutanen, T., *et al.* « Comparison of map-making algorithms for CMB experiments », 2006, *A&A*, 449, 1311
60. Rasera, Y., Teyssier, R. « The history of the baryon budget. Cosmic logistics in a hierarchical universe », 2006, *A&A*, 445, 1

2004

61. Benoit, A., *et al.* « First detection of polarization of the submillimetre diffuse galactic dust emission by Archeops », 2004, *A&A*, 424, 571
62. Bourdin, H., *et al.*, « Temperature map computation for X-ray clusters of galaxies », 2004, *A&A*, 414, 429

2003

63. Benoit, A., *et al.* « Cosmological constraints from Archeops », 2003, *A&A*, 399, 25
64. Benoit, A., *et al.* « The cosmic microwave background anisotropy power spectrum measured by Archeops », 2003, *A&A*, 399, 19

2002

65. Refregier, A., Teyssier, R., « Numerical and analytical predictions for the large-scale Sunyaev-Zel'dovich effect », 2002, *Phys. Rev. D*, 66, 3002
66. Teyssier, R., « Cosmology Hydrodynamics with adaptive mesh refinement. A new high resolution code called RAMSES », 2002, *A&A*, 385, 337

2001

67. Doré, O., Bouchet, F. R., Mellier, Y., Teyssier, R., « Cluster physics from joint weak gravitational lensing and

- Sunyaev-Zel'dovich data », 2001, *A&A*, 375, 14
68. Doré, O., Teyssier, R., Bouchet, F. R., Vibert, D., Prunet, S., « MAPCUMBA: A fast iterative multi-grid map-making algorithm for CMB experiments », 2001, *A&A*, 374, 358
 69. Prunet, S., Teyssier, R., Scully, S. T., Bouchet, F. R., Gispert, R., « Error estimation for the WMAP experiment », 2001, *A&A*, 373, 13
 70. Benuzzi-Mounaix, A., *et al.* « Supernovae Rayleigh-Taylor Instability Experiments on the CEA-Phébus Laser Facility », 2001, *Ap&SS*, 277, 143
 71. Kane, J., *et al.* «Interface imprinting by a rippled shock using an intense laser», 2001, *Phys. Rev. E*, 63, 5401
- 2000**
72. Teyssier, R., Ryutov, D., Remington, B., « Accelerating Shock Waves in a Laser-produced Density Gradient », 2000, *ApJS*, 127, 503
 73. Kane, J., *et al.* « Two-dimensional versus Three-dimensional Supernova Hydrodynamic Instability Growth », 2000, *ApJ*, 528, 989
- 1999**
74. Koenig, M., *et al.*, « Laser driven shock wave acceleration experiments using plastic foams », 1999, *Applied Physics Letters*, 75, 3026
 75. Kane, J., *et al.* « Scaling supernova hydrodynamics to the laboratory », 1999, *Phys. Plasmas*, 6, 2065
- 1998**
76. Teyssier, R., Chièze, J.-P., Alimi, J.-M., « Nonequilibrium Thermodynamics and Cosmological Pancake Formation », 1998, *ApJ*, 509, 62
 77. Audit, E., Teyssier, R., Alimi, J.-M., « Non-linear dynamics and mass function of cosmic structures. II. Numerical results », 1998, *A&A*, 333, 779
 78. Teyssier, R., Chieze, J.-P., Alimi, J.-M., « Are Large X-Ray Clusters at Thermal Equilibrium ? », 1998, *ApJ.*, 495, 630
- 1997**
79. Audit, E., Teyssier, R., Alimi, J.-M., « Non-linear dynamics and mass function of cosmic structures. I. Analytical results », 1997, *A&A*, 325, 439
 80. Chieze, J.-P., Teyssier, R., Alimi, J.-M., « Gas and Dark Matter Spherical Dynamics », 1997, *ApJ*, 484, 40
 81. Teyssier, R., Chieze, J.-P., Alimi, J.-M., « Self-similar Spherical Collapse Revisited: A Comparison between Gas and Dark Matter Dynamics », 1997, *ApJ*, 480, 36
- 1994**
82. Roland, J., Frossati, G., Teyssier, R., « On the origin of extragalactic γ -ray bursters », 1994, *A&A*, 290, 364
 83. Roland, J., Teyssier, R., Roos, N., « On the origin of the variability of superluminal radio sources similar to 3C 273 », 1994, *A&A*, 290, 357
 84. Mirabel, I. F., *et al.* « The radio/infrared counterpart of the hard X-ray transient in Aquila: A possible source of repeated soft gamma-ray bursts », 1994, *A&A*, 282, 17