

MATTEO VIEL

Date of birth: September 5, 1975 **Place of birth:** Udine (Italy)

Nationality: Italian

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Curriculum vitae

- **1994:** High School. Diploma maturità scientifica Liceo Scientifico “G. Marinelli” - Udine (grade: 60/60).
- **1999:** Degree in Physics, Università di Padova, Italy. Thesis: **A merger tree for the formation of cosmic structures**. Thesis supervisors: Prof. Sabino Matarrese, Dr. Giuseppe Tormen. (grade: full mark 110/110 cum laude).
- **9/1999 - 3/2000:** Fellowship of Università di Padova for a period of six months at Max-Planck-Institut für Astrophysik (Garching, Germany).
- **11/1999 - 11/2002:** PhD position at the Physics Department of Università di Padova (Italy).
- **02/2001 - 04/2001:** Visiting period at Max-Planck-Institut für Astrophysik (Garching, Germany).
- **04/2001 - 10/2001:** EARA-Marie Curie Fellowship at Max-Planck-Institut für Astrophysik (Garching, Germany).
- **02/2002 - 07/2002:** EARA-Marie Curie Fellowship at Institute of Astronomy (Cambridge, UK)
- **11/2002 - 10/2003:** Research Associate, Institute of Astronomy (Cambridge, UK)
- **02/2003:** PhD from Università di Padova (Italy), Thesis **“Numerical Models of the Intergalactic Medium”**. Thesis supervisor: Prof. Sabino Matarrese.
- **10/2003 - 10/2006 :** Research Associate - PPARC (Particle Physics Astronomy Research Council) fellowship, Institute of Astronomy (Cambridge, UK)
- **11/2004 - 12/2004 :** Visiting period at KAVLI institute (Santa Barbara) for the program ‘Galaxies-Intergalactic Medium interaction’
- **10/2004 - 10/2006:** Research Fellow Clare Hall College (Cambridge, UK)

- **10/2006 – present: Researcher staff position** at Trieste Observatory (INAF-OATS) (won on Dec. 30/12/2005 but started on Oct 2006)
- **July 2009:** visiting scientist at the IoA, Cambridge (UK)

Main research interests

- **Evolution of the Intergalactic Medium and galaxy-intergalactic medium interplay.**

Evolution of the Lyman- α forest, thermal history and metal enrichment of the Intergalactic Medium. Thermal, dynamical and chemical properties of the Intergalactic Medium. Reionization of the universe and evolution and nature of the Ionizing Background. Impact of galactic winds on the Intergalactic Medium. Low redshift intergalactic gas detectability. HeliumII reionization. Impact of galactic winds and black hole feedback on galaxy evolution and on the IGM. Metal enrichment mechanisms in the high redshift universe.

- **Cosmological parameters.** Absorption lines as a probe of fundamental physics. Recovery of cosmological parameters and properties of the dark matter density field. Effect of dark energy, warm dark matter, neutrinos on the Lyman- α forest structures. Early dark energy models. Cross-correlation of large scale structure and cosmic microwave background data. Multi dimensional likelihood estimation of cosmological parameters using Monte Carlo Markov Chains.

- **Numerical simulations of structure formation.** Hydrodynamical and N-body codes. Evolution of cosmic structures in the high redshift universe. Density profiles of dark matter halos. Comparison of SPH and Eulerian codes for the physics of the IGM. Use of international parallel super computer (COSMOS, HPCS and CINECA in particular) to simulate the IGM.

- **Fundamental physics.** Nature of dark matter and its impact on large scale structures. Constraints on the coldness of cold dark matter and warm dark matter models. Constraints on sterile neutrino particles using the Lyman- α forest. Measuring the cosmic expansion using the Lyman- α forest with the ESO-ELT (Extremely Large Telescope). Dark energy constraints at high redshift ($z > 2$). Constraints on inflationary models and primordial non gaussianity using the IGM. Cross-correlation of the CMB (lensing and temperature) with large scale structure tracers.

- **Quasar absorption lines.** Analysis of observed and simulated quasar spectra: Lyman- α forest and metal lines. Mean flux, flux probability distribution function, power spectrum and bispectrum flux statistics. Statistics of Voigt profile fitted lines. Thermal state of the IGM from line-widths. Low and high resolution data sets (SDSS, Keck and UVES/VLT spectra): systematic and statistical errors.

List of main refereed publications (published only)

- ‘Probing the Intergalactic Medium with the Lyman- α forest along multiple lines of sight to distant quasars’, **M. Viel**, S. Matarrese, H.J. Mo, M. Haehnelt, T. Theuns, 2002, MNRAS, 329, 848
- ‘Modelling the IGM and the Lyman- α forest at high redshift from the dark matter distribution’, **M. Viel**, S. Matarrese, H.J. Mo, T. Theuns, M. Haehnelt, 2002, MNRAS, 336, 685
- ‘Galactic winds in the IGM’, T. Theuns, **M. Viel**, S. Kay, J. Schaye, B. Carswell, P. Tzanavaris, 2002, ApJL, 578, 5
- ‘Detecting X-ray filaments in the low redshift IGM with XEUS and Constellation-X’, **M. Viel**, E. Branchini, R. Cen, S. Matarrese, P. Mazzotta, J.P. Ostriker, 2003, MNRAS, 341, 792
- ‘Dark energy effect on the Lyman- α forest’, **M. Viel**, S. Matarrese, T. Theuns, D. Munshi, Y. Wang, 2003, 340, 47L
- ‘The power spectrum of the flux distribution in the Lyman- α forest of a Large sample of UVES QSO Absorption Spectra (LUQAS)’, T.-S. Kim, **M. Viel**, M.G. Haehnelt, R.F. Carswell, S. Cristiani, 2004, MNRAS, 347, 355
- ‘The effect of (strong) discrete absorption systems on the Lyman- α forest flux power spectrum’, **M. Viel**, M.G. Haehnelt, R.F. Carswell, T.-S. Kim, 2004, MNRAS, 349, 33L
- ‘The bispectrum of the Lyman- α forest at z 2-2.4 from a Large sample of UVES QSO Absorption Spectra (LUQAS)’, **M. Viel**, S. Matarrese, A. Heavens, M.G. Haehnelt, T.-S. Kim, V. Springel, L. Hernquist, 2004, MNRAS, 347L, 26
- ‘Inferring the dark matter power spectrum from the Lyman- α forest in high-resolution QSO absorption spectra’, **M. Viel**, M.G. Haehnelt, V. Springel, 2004, MNRAS, 354, 684
- ‘ Constraints on the Primordial Power Spectrum from High Resolution Lyman- α Forest Spectra and WMAP’, **M. Viel**, J. Weller, M.G. Haehnelt, 2004, MNRAS, 355, 23L
- ‘ The Lyman- α forest opacity and the metagalactic hydrogen ionization rate at z 2-4 ’, J. Bolton, M. Haehnelt, **M. Viel**, V. Springel, 2005, MNRAS, 357, 1178
- ‘ Tracing the Warm Hot Intergalactic Medium in the local Universe ’, **M. Viel**, E. Branchini, R. Cen, J.P. Ostriker, S. Matarrese, P. Mazzotta, B. Tully, 2005, MNRAS, 360, 1105
- ‘ Constraints on Warm Dark Matter from WMAP and the Lyman- α forest ’, **M. Viel**, J. Lesgourgues, M. Haehnelt, S. Matarrese, A. Riotto, 2005, Physical Review, D71, 063534
- ‘ Expansion and Collapse in the Cosmic Web’, M. Rauch, G. Becker, **M. Viel**, W.L.W. Sargent, A. Smette, R.A. Simcoe, T.A. Barlow, M.G. Haehnelt, 2005, ApJ, 632, 58

- ‘Squeezing the window on isocurvature modes with the Lyman- α forest’, M. Beltran, J. Garcia-Bellido, J. Lesgourgues, **M. Viel**, 2005, Physical Review, D72, 103515
- ‘Testing the accuracy of the Hydro-PM approximation in numerical simulations of the Lyman- α forest’, **M. Viel**, M.G. Haehnelt, V. Springel, 2006, MNRAS, 365, 231
- ‘Cosmological and astrophysical parameters from the SDSS flux power spectrum and hydrodynamical simulations of the Lyman-alpha forest’, **M. Viel**, M.G. Haehnelt, 2006, MNRAS, 365, 231
- ‘Spatial fluctuations in the spectral shape of the UV background at $z \approx 3$ and the reionization of helium’, J. Bolton, M. Haehnelt, **M. Viel**, R.F. Carswell, 2006, MNRAS, 366, 1378
- ‘The matter power spectrum at small scales: an estimate from the inverted Lyman- α forest optical depth’, S.Zaroubi, **M. Viel**, A. Nusser, M.G. Haehnelt, T.-S. Kim, 2006, MNRAS, 369, 374
- ‘The Lyman- α forest and WMAP year three’, **M. Viel**, Haehnelt M. G., Lewis A., 2006, MNRAS Letters, 370, 51
- ‘On the formation of dwarf galaxies and stellar haloes’, Read J. I., Pontzen A. P., **M. Viel**, 2006, MNRAS, 371, 885
- ‘Can Sterile Neutrinos Be Ruled Out as Warm Dark Matter Candidates?’, **M. Viel**, J. Lesgourgues, M. Haehnelt, S. Matarrese, A. Riotto, 2006 Physical Review Letters, 97, 071301
- ‘Tomography of the intergalactic medium with Ly-alpha forests in close QSO pairs’, D’Odorico, V.; **M. Viel**; Saitta, F.; Cristiani, S.; Bianchi, S.; Boyle, B.; Lopez, S.; Maza, J.; Outram, P., MNRAS, 2006, 372, 1333
- ‘Numerical Simulations of the Lyman-alpha forest - A comparison of Gadget-2 and Enzo’, Regan J. A., Haehnelt M. G., **M. Viel**, 2007, MNRAS, 374, 196
- ‘Strong MgII systems in quasar and gamma-ray burst spectra’, Porciani C., **M. Viel**, S. Lilly, 2007, ApJ, 659, 218
- ‘Is the Concentration of Dark Matter Halos at Virialization Universal?’, Ricotti M., Pontzen A., **M. Viel**, 2007, ApJ, 664, 53
- ‘A combined analysis of 3D weak lensing, Lyman-alpha forest and WMAP year three data’, Lesgourgues, J., **Viel M**; Haehnelt, M. G, Massey, R., 2007, JCAP, 11, 008L
- ‘Neutrinos and the Lyman-alpha forest: myth or reality?’, **M. Viel**, 2007, Nuclear Physics B Proceedings Supplements, Volume 168, p. 54.
- ‘An improved measurement of the flux distribution of the Lyalpha forest in QSO absorption spectra: the effect of continuum fitting, metal contamination and noise properties’, Kim, T.-S.; Bolton, J. S.; **Viel, M.**; Haehnelt, M. G.; Carswell, R. F., 2007, MNRAS, 382, 1657

- 'How Cold Is Cold Dark Matter? Small-Scales Constraints from the Flux Power Spectrum of the High-Redshift Lyman-alpha Forest', **Viel, Matteo**; Becker, George D.; Bolton, James S.; Haehnelt, Martin G.; Rauch, Michael; Sargent, Wallace L. W., 2008, Physical Review Letters, 100, 1304V
- 'Tracing the gas at redshift 1.7-3.5 with the Ly-alpha forest: the FLO approach', Saitta, F.; D'Odorico, V.; Bruscoli, M.; Cristiani, S.; Monaco, P.; **Viel, M.**, 2008, MNRAS, 385, 519
- 'Cosmic reionization in dynamic quintessence cosmology', Crociani, D.; **Viel, M.**; Moscardini, L.; Bartelmann, M.; Meneghetti, M., 2008, MNRAS, 385, 728
- 'Possible evidence for an inverted temperature-density relation in the intergalactic medium from the flux distribution of the Ly-alpha forest', Bolton, J. S.; **Viel, M.**; Kim, T.-S.; Haehnelt, M. G.; Carswell, R. F., 2008, MNRAS, 386, 1131
- 'Cosmic dynamics in the era of Extremely Large Telescopes', Liske, J.; Grazian, A.; Vanzella, E.; Dessauges, M.; **Viel, M.** et al., 2008, MNRAS, 386, 1192
- 'On the importance of high-redshift intergalactic voids', **Viel, Matteo**; Colberg, Jrg M.; Kim, T.-S., 2008, MNRAS, 386, 1285
- 'The relation between Lyman-a absorbers and gas-rich galaxies in the local Universe', Pierleoni, Marco; Branchini, Enzo; **Viel, Matteo**, 2008, MNRAS, 388, 282
- 'The effects of primordial non-Gaussianity on the cosmological reionization', Crociani, D.; Moscardini, L.; **Viel, M.**; Matarrese, S., 2009, MNRAS, 394, 133
- 'The evolution of a pre-heated Intergalactic Medium', Borgani S., **Viel, M.**, 2009, MNRAS Lettersm 392, 26
- 'The quasar proximity effect at redshift $< z > \sim 2.6$ with the From Lines to Overdensities approach', D'Odorico, V.; Bruscoli, M.; Saitta, F.; Fontanot, F.; **Viel, M.**; Cristiani, S.; Monaco, P., 2008, MNRAS, 389, 1727
- 'Primordial non-Gaussianities in the Intergalactic Medium', **Viel, M.**; Branchini, E.; Dolag, K.; Grossi, M.; Matarrese, S.; Moscardini, L., 2009, MNRAS, 393, 774
- 'Lyman-alpha constraints on warm and on warm-plus-cold dark matter models', Boyarsky, A.; Lesgourgues, J.; Ruchayskiy, O.; **Viel, M.**, 2009, JCAP, 05, 012
- 'Realistic sterile neutrino dark matter with keV mass does not contradict cosmological bounds', Boyarsky, A.; Lesgourgues, J.; Ruchayskiy, O.; **Viel, M.**, 2009, Physical Review Letters, in press
- 'Studying the WHIM with GRBs', Branchini E., Ursino, E.; Corsi, A.; Martizzi, D.; Amati, L.; den Herder, J. W.; Galeazzi, M.; Gendre, B.; Kaastra, J.; Moscardini, L.; Nicastro, F.; Ohashi, T.; Paerels, F.; Piro, L.; Roncarelli, M.; Takei, Y. **Viel, M.**, 2009, ApJ, 697, 328
- 'Damped Lyman-alpha systems in high-resolution hydrodynamical simulations', Tesconi E., **Viel, M.**, Tornatore L., Borgani S., 2009, MNRAS, 397, 441

- 'Early dark energy at high redshifts: status and perspectives', Xia J.-Q., **Viel, M.**, 2009, JCAP, 04, 002
- 'Cosmological and astrophysical constraints from the Lyman-alpha forest flux probability distribution function', **Viel, M.**, Bolton J.-S., Haehnelt M.G., 2009, MNRAS Letters, 399, 39
- The High Redshift Integrated Sachs Wolfe Effect, Xia J.-Q., **Viel, M.**, Baccigaluppi, C., Matarrese S., 2009, JCAP, 09, 003
- Lenses in the forest: cross-correlation of the Lyman-alpha flux with CMB lensing , Vallinotto A., Das S., Spergel D.N., **Viel M.**, 2009, Physical Review Letters, 103, 091304
- Primordial Non-Gaussianity and the NRAO VLA Sky Survey, Xia, Jun-Qing; **Viel, M.**; Baccigalupi, Carlo; De Zotti, Gianfranco; Matarrese, Sabino; Verde, Licia, 2010, ApJ Letters, 717, 17
- The effect of neutrinos on the matter distribution as probed by the intergalactic medium, **Viel, M.**; Haehnelt, M. G.; Springel, V., 2010, JCAP, 06, 015
- High-redshift cosmography, Vitagliano, V.; Xia, J-Q.; Liberati, S.; **Viel, M.**, 2010, JCAP, 03, 005
- The impact of feedback on the low-redshift intergalactic medium, Tornatore, L.; Borgani, S.; **Viel, M.**; Springel, V., 2010, MNRAS, 402, 1911
- The rise of the CIV mass density at $z \lesssim 2.5$, D'Odorico, V.; Calura, F.; Cristiani, S. ; **Viel, M.**, 2010, MNRAS, 401, 2715
- High-resolution spectroscopy of the 3D cosmic web with close QSO groups, Cappetta, M.; D'Odorico, V.; Cristiani, S.; Saitta, F.; **Viel, M.**, 2010, MNRAS in press

Proceedings, refereed proceedings and non refereed publications

- 'Numerical models of the Intergalactic Medium', M. Viel, 2003, The Observatory, Vol. 123, p. 174
- 'Cosmology with the Lyman- α forest in the WMAP era', M. Viel, 2003, proceedings of the XVth Rencontres de Blois, astro-ph/0310413
- 'Quantitative Cosmology with the Lyman-Alpha Forest', M.Viel, 2004, Presented at the KITP Program: Galaxy-Intergalactic Medium Interactions, Nov 23, 2004, Kavli Institute for Theoretical Physics
- 'The Lyman- α forest according to LUQAS', M. Viel et al., Talk given by M. Viel at the XXXIXth Rencontres de Moriond on Exploring the Universe, astro-ph/0405584

- ‘Quantitative cosmology with the Lyman- α forest’, M. Viel, 2004, Talk given at the conference ‘Baryons in Dark Matter Halos’, Novigrad (Croatia), <http://pos.sissa.it>
- ‘The Large Programme: Cosmic Evolution of the IGM’, J. Bergeron et al., The ESO Messenger, 2004, 118, 40-44, <http://www.eso.org/gen-fac/pubs/messenger/>
- ‘The Lyman- α forest as a probe of fundamental physics’, Talk given by M. Viel at the IAU Colloquium 1999, “Probing galaxies through quasar absorption lines”, Shanghai (China) 14-18/03/05, astro-ph/0504645
- ‘Constraints on the metagalactic hydrogen ionization rate from the Lyman-alpha forest opacity’, J. Bolton, M.G. Haehnelt, M. Viel, V. Springel, Proceedings of the IAU Colloquium 1999, “Probing galaxies through quasar absorption lines”, Shanghai (China) 14-18/03/05, astro-ph/0504437
- ‘Probing 3-D matter distribution at $z \sim 2$ with QSO multiple lines of sight’, S.Cristiani et al., Proceedings of the IAU Colloquium 1999, “Probing galaxies through quasar absorption lines”, Shanghai, astro-ph/0506195 (China) 14-18/03/05
- ‘The Lyman- α Forest As a Cosmological Probe’, M. Viel, New Horizons in Astronomy: Frank N. Bash Symposium ASP Conference Series, Vol. 352, Proceedings of the Conference Held 16-18 October, 2005 at The University of Texas, Austin, Texas, USA, p.191, 2006ASPC..352..191V
- ‘ESTREMO/WFXRT: extreme physics in the transient and evolving cosmos’, Piro L. et al, 2006, SPIE–The International Society for Optical Engineering, 2006SPIE.6266E..16P
- ‘CODEX: measuring the acceleration of the universe and beyond’, Pasquini L. et al., 2006, The Scientific Requirements for Extremely Large Telescopes, Proceedings of the 232nd Symposium of the International Astronomical Union, Held in Cape Town, South Africa, November 14-18, 2005, Edited by Patricia Ann Whitelock; Michel Dennefeld; Bruno Leibundgut. Cambridge: Cambridge University Press, 2006., pp.193-197, 2006IAUS..232..193P
- ‘CODEX: Measuring the Expansion of the Universe’, Paquini L., et al, 2005, The Messenger, 122, 10
- ‘Cosmology and Fundamental Physics with the Lya forest’, M. Viel, 2006, Proceedings of Bernard’s Cosmic Stories: from primordial fluctuations to the birth of stars and galaxies. June 26-30, 2006. UIMP, VALENCIA, SPAIN. Meeting abstracts, <http://www.astro.rug.nl/bernard60/index.php>, p.11.1
- ‘The CODEX-ESPRESSO experiment: Cosmic dynamics, fundamental physics, planets and much more...’, Cristiani et al., 2007, Il Nuovo Cimento B, vol. 122, Issue 9, p.1165-1170, arXiv:0712.4152 (**refereed publication**)
- ‘E-ELT and the Cosmic Expansion History A Far Stretch?’, Liske et al, 2008, The Messenger, 133, 10

- 'EDGE: Explorer of diffuse emission and gamma-ray burst explosions', Piro et al., 2009, EXA, 9, 23, 67 **refereed publication**
- 'Codex', Pasquini et al., 2008, Precision Spectroscopy in Astrophysics, 249, Ed. Santos Pasquini Correia Romaniello
- 'The Impact of Simulations in Cosmology and Galaxy Formation A summary of the Workshop NOVICOSMO 2008', Salucci, Borgani, Frenk, Moscardini, Viel, arXiv:0812.0333
- 'ESPRESSO: A High Resolution Spectrograph for the Combined Coud Focus of the VLT', Pasquini et al., 2009, Science with the VLT in the ELT Era, Astrophysics and Space Science Proceedings, Volume . ISBN 978-1-4020-9189-6. Springer Netherlands, 2009, p. 395
- 'From Espresso to Codex', Liske et al., 2009, Science with the VLT in the ELT Era, Astrophysics and Space Science Proceedings, Volume . ISBN 978-1-4020-9189-6. Springer Netherlands, 2009, p. 243, arXiv:0802.1926
- 'The Lyman-alpha Forest as a Probe of the Coldness of Dark Matter', M. Viel, 2008, IFAE 2007: Incontri di Fisica delle Alte Energie Italian Meeting on High Energy Physics Napoli, 11-13 April 2007, ISBN 978-88-470-0746-8. Springer-Verlag Italia, 2008, p.255

Conferences and Schools

- **9/2000**: Joint 2000 annual meeting: European TMR network ‘The Formation and Evolution of galaxies’ and European RTN network ‘The Physics of the Intergalactic Medium’, Durham, UK. Oral presentation.
- **9/2000**: National School of Cosmology and Astrophysics, Asiago, Italy. Oral presentation.
- **04/2001**: RTN workshop ‘Computational Investigations of the Intergalactic Medium’, Garching, Germany. Oral presentation.
- **06/2001**: IAP colloquium: ‘Gaseous Matter in Galaxies and in the Intergalactic Space’, Paris, France. Poster presentation.
- **06/2001**: RTN workshop ‘The First Stars and the Reionization of the Universe’, Florence, Italy
- **08/2001**: ‘Lighthouses of the Universe’, Garching (Germany)
- **10/2001**: National School of Astrophysics, Trieste, Italy. Oral presentation.
- **10/2001**: RTN network ‘The Physics of the Intergalactic Medium’, Eibsee, Germany. Oral presentation.
- **02/2002**: ‘Lyman- α emission at high redshift’, Institute of Astronomy, Cambridge (UK)
- **06/2002**: Elba (Italy) 2002 conference. ‘Early cosmic structures and the end of the dark ages’. Oral presentation.
- **07/2002**: Cambridge, UK. ‘Making light of gravity’. Poster presentation.
- **09/2002**: Gargonza (Italy) RTN annual meeting ‘The Physics of the IGM’. Oral presentation.
- **11/2002**: Roma (Italy). Convegno nazionale di Cosmologia. Oral presentation.
- **06/2003**: Blois (France). XVth rencontres de blois “Physical Cosmology”. Oral presentation.
- **09/2003**: Ile d’Oleron (France). RTN annual meeting ‘The Physics of the IGM’. Oral presentation.
- **10/2003**: Vulcano (Italy). International workshop on “Modelling the intergalactic and intracluster media”. Oral presentation.
- **04/2004**: La Thuile (Italy). XXXIXth Rencontres de Moriond on Exploring the Universe. Oral presentation.
- **05/2004**: Haifa (Israel). Meeting “Mass and Light in the Universe”. Oral presentation.
- **09/2004**: Leiden (Holland). RTN annual meeting ‘The Physics of the IGM’. Oral presentation.

- **10/2004**: Novigrad (Croatia). Conference “Baryons in dark matter halos”. Oral presentation.
- **11/2004**: Santa Barbara (US). Workshop “Galaxies-Intergalactic Medium Interactions”. Oral presentation.
- **03/2005**: Shanghai (China). IAU 1999 Colloquium “Probing galaxies through quasar absorption lines”. Oral presentation.
- **04/2005**: Granada (Spain). Cosmology Workshop. Oral presentation.
- **06/2005**: Trieste (Italy). Conference on Computational Cosmology. Oral Presentation.
- **08/2005**: Chiemsee (Germany). IGM Workshop. Oral Presentation.
- **10/2005**: Austin (Texas, US). Invited review “The Lyman- α forest as a cosmological probe” at the Frank N. Bash 2005 symposium.
- **06/2006**: Valencia (Spain). Talk. ‘BERNARD’S COSMIC STORIES’ conference.
- **09/2006**: Conca Specchiulla (Lecce, Italy). Invited talk. “Constraints on neutrinos from Lyman- α ”
- **09/2006**: Conca Specchiulla (Lecce, Italy). Invited talk. “Constraints on neutrinos from Lyman- α ”
- **01/2007**: Virgo Meeting (Leiden, Holland) oral presentation: “The high redshift Lyman- α forest and the nature of dark matter”
- **04/2007**: IFAE conference (Naples, Italy). Invited talk. “Fundamental Physics with the Intergalactic Medium”
- **07/2007**: Conference “HI survival trough cosmic time”. Talk.
- **02/2008**: Entapp (DESY, Hamburg) Invited chair of DM session and Talk.
- **02/2008**: Conference at APC (Paris) “Dark matter at small scales”. Talk.
- **04/2008**: IFAE 2008 Bologna. Talk.
- **06/2008**: IAP colloquium 2008 (Paris). “The universe above $z=3$ ”. Talk.
- **02/2009**: Galilei Institute Florence (Italy). “Dark Matter”. Talk.
- **02/2010**: La Thuile (Italy). Rencontres de Moriond on Cosmolgy. Talk.
- **06/2010**: ESF workshop “The almost Gaussian Universe”. Talk.
<http://ipht.cea.fr/Meetings/GaussUniverse2010/>

Seminars

- **03/2001**: Institute Seminar at MPA.

- **03/2001**: Cosmology Seminar at MPA.
- **11/2001**: Institute Seminar at Dipartimento di Astronomia di Padova (Italy)
- **11/2001**: Cosmology Seminar at Osservatorio Astrofisico di Arcetri (Florence, Italy).
- **11/2001**: Institute Seminar at Osservatorio Astronomico di Trieste (Italy).
- **11/2002**: Institute Seminar at Institute of Astronomy Cambridge (UK)
- **09/2003**: Institute Seminar at Osservatorio Astronomico di Trieste (Trieste, Italy).
- **10/2003**: Institute Seminar at SISSA (Trieste, Italy).
- **10/2003**: Institute Seminar at Dipartimento di Astronomia di Bologna (Bologna, Italy)
- **10/2003**: Institute Seminar at Osservatorio Astronomico di Padova (Bologna, Italy)
- **03/2004**: Institute Seminar at Department of Astronomy, University of Sussex (Brighton, UK)
- **11/2004**: Cosmology Seminar at Department of Astronomy, University of Oxford (Oxford, UK)
- **11/2004**: Lyman- α forest seminar, University of Berkeley (US)
- **12/2004**: Astrophysics Colloquium, Fermilab (US)
- **12/2004**: Seminar at the Astronomy Department, Princeton (US)
- **07/2005**: Institute Seminar at Institute of Astronomy Cambridge (UK)
- **10/2006**: Institute Seminar at Trieste Observatory (Italy)
- **11/2006**: Institute Seminar at Scuola Normale Superiore di Pisa (Italy)
- **03/2007**: Institute Seminar at ICTP (Institute Cosmology and Theoretical Physics (Trieste, Italy)
- **05/2007**: Seminar at IASF/BO. Institute for astrophysics (Bologna, Italy).

Teaching experience

- Supervisor, Part III Physics “ Gravitational Astrophysics and Cosmology ” a course held by Professors Lasenby, Fabian, Rees and Hobson (Physics Department - University of Cambridge)
- Supervisor, Part III Maths “Physical Cosmology ”, a course held by Prof. Pettini and Dr. Weller (DAMTP - University of Cambridge)
- Lecturer at Università La Sapienza, Cosmology course for PhD students “Intergalactic Medium Cosmology”, 2007, 12 hrs course
- Lecturer at SISSA “Structure formation” for PhD students, 2009 and 2010, 12 hrs course

Conferences organized

- July 2004, Cambridge (UK) Institute of Astronomy, workshop “Cosmology with the Lyman-alpha”
- NOVICOSMO 2008, Trieste October 2008, International conference : “The impact of Simulations in. Cosmology and Galaxy Formation
- ICTP (Trieste, Italy) Cosmology school 2010:
<http://cdsagenda5.ictp.trieste.it/fulldisplay.php?ida=a07163>

Outreach

- Physorg: <http://www.physorg.com/news76328087.html>
- <http://www.fnal.gov/pub/today/archive2006/today06-09-06.html>
- ESI-TOPICS: Emerging Research Fronts Comments <http://www.esi-topics.com/erf/2006/october06-MatteoViel.html>
- FEST (Festival Editoria Scientifica Triestina) 2007 Trieste. Talk.
- SPACE ART at immaginario scientifico Trieste. October 2008.
- On average 5/6 public talks per year.

Main collaborations

- CODEX and ESPRESSO instruments: high resolution spectrographs on the E-ELT (ESO - Extremely Large Telescope)
- EUCLID collaboration WG theor
- Cambridge - UK (Institute of Astronomy); Garching - Germany (MPA, ESO), CERN (Switzerland), Padua University (Italy), Princeton University and Princeton Observatory (US)
- X-Shooter instrument
- Computational projects on european parallel supercomputers: COSMOS, HPCS (Cambridge); CINECA (Italy); Marenostrum (Spain).

Citations

~ 1600 citations (~ 900 as a first author) h-index = 23 (June 2010: from NASA/ADS web site and SPIRES)

Referee activity

Astronomy and Astrophysics, MNRAS, MNRAS Letters, Physical Review D, JCAP, Astrophysical Journal

GRANTS

PRIN-INAF 2010: 110 kE (4 nodes, national P.I.); ASI/AAE 2006-2009 (Alte Energie project) 60 kE in 3 yrs (local P.I. at INAF-OATS, national P.I. Prof. Moscardini).

PhD-Students

E. Tescari (Thesis defended in April 2010) “Chemical and Physical Properties of the Intergalactic Medium.

REFEREES

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