

Curriculum Vitae of Tommaso Treu (As of November 2009)

Personal:

Born in Milan, Italy, 21st January 1975. Italian Citizenship (US permanent resident).

Address:

Department of Physics
University of California Santa Barbara
Santa Barbara, CA, 93106-9530
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Education:

- Ph.D. in Physics at the Scuola Normale Superiore: 70/70 *cum laude*. February 2001
- Scuola Normale Fellow Degree in Physics: 70/70 *cum laude*. November 1998
- 'Laurea in Fisica' at the University of Pisa: 110/ 110 *cum laude*. October 1997

Fellowships and Awards:

- H.J. Plous Memorial Award. 2008
- David and Lucille Packard Fellowship for Science and Engineering. 2007
- UC Regents Junior Faculty Fellowship Award. 2007
- NSF-CAREER Award. 2007
- Alfred P. Sloan Research Fellowship. 2007
- Hubble Fellowship. 2003
- Graduate Fellowship at the Scuola Normale Superiore. 1997
- Undergraduate Fellowship at the Scuola Normale Superiore. 1993

Positions:

- July 2008- present: Tenured Associate Professor. University of California, Santa Barbara
- July 2004- June 2008: Assistant Professor. University of California, Santa Barbara (on leave without pay until March 2005)
- September 2003 - February 2005: Hubble Fellow. University of California, Los Angeles
- November 2000 - August 2003: Postdoctoral Scholar. California Institute of Technology

- September 1998 - August 2000: Graduate Student. Space Telescope Science Institute
- January 1998 - November 2000: Physics Ph.D. student. Scuola Normale Superiore
- November 1993 - October 1997: Fellow at the Scuola Normale Superiore and undergraduate physics student at the University of Pisa

Observing Experience:

- KeckII: 27 nights (DEIMOS); 15 nights (ESI); 2 nights (NIRSPEC); 1.5 nights (OSIRIS); 3 nights (NIRC2)
- KeckI: 38.5 nights (LRIS)
- ESO-VLT: 1.4 nights + 69.4 hrs (FORS1/2); 3 nights + 2.5 hrs (ISAAC)
- Subaru: 2 nights (suprime-camera)
- Mt. Palomar-200": 4 nights (COSMIC)
- ESO-NTT: 3 nights (EMMI); 3 nights (SUSI2)
- ESO-3.6m: 9 nights (EFOSC2)
- TNG. 4 nights (OIG)
- Lick-3m: 20 nights (KAST)

Teaching Experience:

- “Origins: a dialog between scientists and humanists”. Lower division, general education course, UCSB. S08/S09. Taught jointly with Stefania Tutino and Richard Hecht
- “Origins: a dialog between scientists and humanists”. Freshman Seminar, UCSB. S07. Taught jointly with Stefania Tutino and Richard Hecht
- “Extragalactic astronomy and cosmology”. Upper division, UCSB Physics Dept. W07
- “History of the Universe”. Lower division, general education course, UCSB, S06/S09
- “Physics of the interstellar medium”. Graduate course, UCSB Physics Dept; F05/F07
- Invited Lecturer at the summer school “Scuola Nazionale di Astrofisica- Lensing Gravitazionale - Il Caos e le sue Conseguenze Astrofisiche” Bertinoro, Italy, May 17-21 2004. Title of the lecture course: “Strong Lensing: Probes of Galactic Structure”

Committees, working groups, referee, conferences:

- Astro2010 Decadal Review Science Frontier Panel Galaxies Across Cosmic Time (2009)
- University of California Observatory Advisory Committee (2007-)
- Space Telescope Users Committee (2006-2009)
- Next Generation Adaptive Optics Science Advisory Team (2009-)
- TMT/IRIS Science Team
- Time Allocation Committees:
 - California Institute of Technology Optical Telescopes (Keck and Palomar; 2003)
 - Spitzer Space Telescope (2004/2006/2008. Cycle-1, 3, 6)
 - Hubble Space Telescope (2006. Cycle-15)
 - Chandra Space Telescope (2008. Cycle-10)
- Member:
 - American Astronomical Society (1999-)
 - International Astronomical Union (2009-)
- UCSB Physics Dept committees:
 - Colloquium (Spring 2006, Fall 2006, Fall 2007)
 - Graduate admission (Winter 2007, Winter 2008, Winter 2009)
 - FTE Planning committee (2008-2009)
 - Development committee (2009-2010; chair)
- Leading coordinator of KITP program and conference “Applications of gravitational lensing: unique insights into galaxy formation and evolution” (September-November 2006)
- Member of the Scientific Organizing Committee of the conferences:
 - “Dark Matter in early-type galaxies” Rio, Brazil (JD1 at the 2009 IAU General Assembly), August 2009 (co-chair)
 - “Strong gravitational lensing in the next decade”, Cogne, Italy, June 2009 (co-chair)
 - “Unveiling the mass: extracting and interpreting galaxy masses” Kingston, Canada, June 2009
 - “OZ Lens 2008 Dark matter, dark energy, and dark ages with gravitational lensing Gravitational lensing”, Sydney, Australia, October 2008
 - “Probing stellar populations out to the distant universe”. Cefalu’, Italy, September 2008
 - “Galaxy structure and the structure of galaxies”, Ensenada, Mexico, March 2008
 - “Applications of gravitational lensing: unique insights into galaxy formation and

evolution”, Santa Barbara, October 2006 (co-chair)

Referee for:

- Journals: Astrophysical Journal, Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, Astronomical Journal, Nature, Nuovo Cimento
- Funding Agencies: National Science Foundation, Chilean Fondecyt, Netherlands Organization for Scientific Research, Italian National Institute of Astrophysics, Italian Space Agency
- Telescope Allocation Committees: British PPARC/STCF; Canadian Gemini TAC; Dutch William Herschel Telescope

Students and Postdocs:

- Undergrad: Scott Argyres (UCSB, 2009-2010; supervised with V.N.Bennert)
- Undergrad: Alexandre de Gris (UCSB, Spring 2009; supervised with V.N. Bennert)
- Undergrad: Moses J. Marsh (UCSB, Summer 2008 – Fall 2008; supervised with M. Bradac)
- Undergrad: Elisabeth R. Newton (UCSB, 2008 - 2009 ; supervised with P. Marshall)
- Undergrad: Gilles Orban-de-Xivry (UCSB, Spring 2008; supervised with P. Marshall)
- Undergrad: Alexia Gorecki (UCSB, Spring and Summer 2007; supervised with R. Gavazzi)
- Undergrad: Kathryn L. McGill (UCSB, 2006 -2007; supervised with J.H. Woo)
- Undergrad: Matthew A. Ferry (UCLA, summer 2004; supervised with M. Malkan)
- Undergrad: Ting X. Liao (Caltech, 2003-2004; supervised with R. Ellis)
- Grad: Anna Pancoast (UCSB, 2009; supervised with B.Brewer)
- Grad: Andrea Ruff (Melbourne, 2009-; supervised with R. Webster)
- Grad: Anna M. Nierenberg (UCSB, 2009- ; supervised with M. Auger)
- Grad: Jeremy Jacob (UCSB, 2006-2008; Msc 2008; supervised with E. Gallo)
- Grad: Laura D. Melling (UCSB, 2005 - 2006; MSc 2006)
- Grad: Sean M. Moran (Caltech, 2002-2007; PhD 2007; supervised with R.Ellis; currently postdoc at Johns Hopkins University)
- Grad: David J. Sand (Caltech, 2001 - 2005; PhD 2005; supervised with R. Ellis; currently CfA-LCOGT fellow at Harvard/LCOGT)
- Postdoc: Matteo Barnabe’ (UCSB, 2009)
- Postdoc: Brendon J. Brewer (UCSB, 2009 – present)
- Postdoc: Matthew W. Auger (UCSB, 2008 – present)
- Postdoc: Vardha Nicola Bennert (UCSB, 2008 - present)

- Postdoc: Marusa Bradac (UCSB, 2007 – 2009; Hubble Fellow; currently Assistant Professor at UC Davis)
- Postdoc: Philip J. Marshall (UCSB, 2006 – 2009; TABASGO Fellow; currently Kavli Fellow at Stanford)
- Postdoc: Raphael Gavazzi (UCSB, 2006 – 2007; currently staff member at Institut d’Astrophysique de Paris)
- Postdoc: Jonghak Woo (UCSB, 2005 – 2008; currently faculty at Seoul National University)

Grants and awards:

- **2009. HST-GO-11978:** Luminous and dark matter in disk galaxies form strong lensing and kinematics. (\$204,070)
- **2008. HST-GO-11588:** Galaxy-scale Strong lenses from the CFHTLS Survey. (\$41,048)
- **2008. HST-GO-11701:** The jackpot in technicolor: photometric redshift and mass to light decomposition of a double Einstein ring. (\$23,722)
- **2007. HST-GO-11341:** Lower luminosity AGN at cosmologically interesting redshifts: SED and accretion rates of $z=0.36$ Seyferts. (\$45,867)
- **2007. Packard Fellowship.** (\$825,000)
- **2007. HST: GO-11099:** A silver bullet for the sources of reionization. (\$157,234)
- **2007. HST: HF-01206:** Dark matter and the highest redshift galaxies: measuring the invisible with gravitational lensing (Hubble Fellowship to Marusa Bradac). \$196,171
- **2007. HST: GO-11208:** The co-evolution of spheroids and black holes in the last six billion years. (\$65,775)
- **2007. HST: GO-11202:** The structure of early -type galaxies: 0.1-100 effective radii. (\$232,457)
- **2007. NSF-CAREER:** Dark matter and Black holes over cosmic time. (\$707,701)
- **2007. Sloan Research Fellowship.** (\$45,000)
- **2006. Chandra/Spitzer:** The duty cycle of active galactic nuclei: X-raying Virgo. (\$268,208)
- **2006. Spitzer:** Obscured activity and environment: a 24 micron survey. (\$6,050)
- **2006. Spitzer:** IRS spectroscopy of LIRGS in the cluster CL0024+16 at $z=0.4$. (\$27,712)
- **2006. HST: GO-10798:** Dark halos and substructure from arcs and einstein rings. (\$182,140)
- **2005. HST: GO-10494:** Imaging the mass structure of distant galaxies. (\$140,646)
- **2004. GALEX: GO-22:** A wide-field UV study of two $z\sim 0.5$ clusters. (\$7,700)
- **2004. Spitzer:** A Panoramic 24-um/HST Survey for Obscured Activity in Clusters at $z\sim 0.5$.

- (\$9,400)
- **2004. HST: GO-10216:** Co-evolution of spheroids and black holes. (\$67,785)
- **2004. HST: GO-13-10174.** Dark-matter halos and evolution of high-z early-type galaxies. (\$15,987)
- **2004. HST: GO-13-10158.** ACS Observations of the Gravitational Lens B1608+656: Characterizing the Einstein Ring. (\$5,971)
- **2003. HST: AR-12-9920:** The mass assembly history of early-type galaxies at $z \sim 1$. (\$14,000)
- **2003. HST: HF-01167.01:** The Formation of Spheroids: Environmental Processes and the Black Hole Connection. Faculty sponsor Matthew Malkan. (Hubble Fellowship)
- **2003. HST: AR-12-9960:** The Lenses Structure and Dynamics (LSD) Survey: mass distribution and stellar populations of high redshift E/S0 galaxies. (\$32,236)
- **2002. HST: AR-11-9527:** The distribution of dark matter in cD galaxies with giant arcs: combining kinematic and lensing tracers. (\$50,000)
- **2001. HST: AR-10-9222:** The Fundamental Plane of field early-type galaxies from $z \sim 0.7$ to $z=0$. (\$9,638)

Invited Talks, Public Talks, and Press Releases:

- Colloquium at the University of Toronto, Canada (10/30/09) “Dark matter in galaxies and clusters of galaxies”
- Colloquium at the University of Massachusetts, Amherst (9/24/09) “Dark matter in galaxies and clusters of galaxies”
- Invited talk at the meeting “Dark matter in early-type galaxies”, Rio de Janeiro, Brazil, (8/4/09) “Empirical scaling relations”
- Invited talk at University College, London, UK, (7/23/09) “Dark matter in galaxies and clusters of galaxies”
- Invited talk at Imperial College, London, UK, (7/21/09) “Co-evolution of spheroids and black holes”
- Invited talk at the meeting “Dark halos from smallest to largest scales”, Bologna, Italy, (6/30/09) “New constraints on the dark matter profile of galaxy clusters”
- Invited Summary talk at the meeting “Gravitational lensing in the next decade”, Cogne, Italy (6/26/09)
- Invited Review at the meeting “Unveiling the mass”, Kingston, Canada, (6/17/09), “Strong and weak lensing”

- Colloquium at Ohio State University, Columbus, Ohio, (02/26/09) “Dark matter and black holes over cosmic time”
- Invited talk at Trieste Observatory, Trieste, Italy, (12/17/08) “Dark matter in galaxies and clusters of galaxies”
- Invited talk at the International School of Advanced Studies, Trieste, Italy, (12/15/08) “Supermassive black holes and galaxy evolution”
- Invited Review at the meeting “Oz-Lens 2008”, Sydney, Australia, (09/29/08), “Strong lensing by galaxies”
- Invited talk at the Packard Fellow Symposim, Park City, UT (09/03/08) “Dark matter and gravitational lensing”
- Invited talk at Oxford University, Oxford, UK, (07/24/08) “Dark matter and black holes over cosmic time”
- Invited talk at the meeting “Galactic Structure and the structure of galaxies”, Ensenada, Mexico, (03/17/08) “Lensing insights into early-type galaxies”
- Colloquium at the University of California, Santa Cruz, CA (02/20/08) “Dark matter and black holes over cosmic time”
- Colloquium at the University of Arizona, Tucson, AZ (01/24/08) “Dark matter and black holes over cosmic time”
- Colloquium at the University of Colorado, Boulder, CO (12/03/07) “Luminous and dark matter in early-type galaxies”
- Colloquium at the Institute for Astronomy, Honolulu, HI, (09/11/07) “Dark matter and black holes over cosmic time”
- Invited talk at the “Dark Matter Workshop”, Copenhagen, Denmark, (08/22/07), “"Dark matter in early-type galaxies from 0 to 100 effective radii"”
- Review talk at the meeting “Tracing cosmic evolution with galaxy clusters”, Sesto, Italy, (06/28/07), “Scaling laws of cluster and field galaxies”
- Invited talk at the meeting “Dark matter in galaxies and galaxy clusters”, Bologna, Italy (06/19/07), “Strong and weak lensing on galaxy scales”
- Cosmology seminar at UC Irvine, (5/24/07) “Luminous and dark matter in early-type galaxies”
- Invited talk at the meeting, “Quantitative science with adaptive optics”, Santa Cruz CA (3/28/07) “The kinematics of Einstein Rings”
- Colloquium at Princeton University, (2/13/07) “Luminous and dark matter in early-type galaxies”
- Invited talk at Trieste Observatory, (12/11/06) “Dark matter and black holes over cosmic time”

- Invited talk at the conference, “Applications of gravitational lensing, unique insights into galaxy formation and evolution”, Santa Barbara, CA (10/04/06) “Galaxy scaling laws under the gravitational microscope”
- Invited talk at the 235th Symposium of the International Astronomical Union, Prague, CZ, (08/14/06) “Spheroids Scaling Relations over cosmic time”
- Invited Review at the meeting ”Gravitational Lensing”, Leiden, NL, (08/04/06) “ Cluster lensing”
- Astronomy Colloquium at the California Institute of Technology, Pasadena, CA (05/31/06) “Cosmic evolution of spheroids: stellar populations, dark matter halos, and supermassive black holes”
- Invited talk at the meeting “Galaxies and structures over cosmic time”, Venice, Italy (03/28/06). “Scaling relations of spheroids over cosmic time”
- Lunch talk, IPAC, Pasadena, CA. (03/08/06), “Cosmic evolution of spheroids: stellar populations, dark matter halos, and supermassive black holes”
- Cosmology Seminar, Berkeley, CA, (02/14/06), “Cosmic evolution of spheroids: stellar populations, dark matter halos, and supermassive black holes”
- Physics Colloquium, University of California Santa Barbara, (11/08/05). “Strong lensing and cosmology”
- Invited talk at the meeting “Distant Clusters of Galaxies”, Ringberg, Germany (10/26/05). “A multi-wavelength wide field study of two clusters at $z=0.5$ ”
- Invited talk at the meeting “From simulations to surveys”, Ringberg, Germany (06/27/05). “Stars and dark matter in early-type galaxies from lensing and dynamics”
- Invited talk at the University of California, Irvine, CA (05/10/05). “Stellar populations and dark matter halos of early-type galaxies to $z\sim 1$ ”
- Invited talk at the Kapteyn institute, Groningen, Netherlands, (03/30/05). “The mass assembly history of early-type galaxies to $z=1.2$ ”
- Invited talk at the Kavli Institute for Theoretical Physics, Santa Barbara, CA (11/18/04). “Cosmic evolution of spheroids: dark matter halos, stellar mass and supermassive black-holes”
- Invited talk at the Stanford University, CA, (05/27/04). “The dark halos of early-type galaxies and the Hubble Constant”
- Invited talk at the meeting “The outskirts of clusters”, Torino, Italy (03/14/04). “Wide field imaging of distant clusters”
- Colloquium at the Space Telescope Science Institute, Baltimore, MD (03/03/04). “The dark halos of early-type galaxies and the Hubble Constant”
- Invited talk at the Johns Hopkins University, Baltimore, MD (03/02/04). “Clusters of

- galaxies in a hierarchical Universe: dark matter halos and environmental processes”
- Colloquium at the University of California, Santa Barbara, CA (02/25/04). “The dark halos of early-type galaxies and the Hubble Constant”
 - Invited talk at the meeting “Dark Matter 2004”, Marina del Rey, CA (02/18/04). “The dark halos of spheroids and the Hubble Constant”
 - Colloquium at the University of California, Berkeley, CA (02/05/04). “Clusters of galaxies in a hierarchical Universe: dark matter halos and environmental processes”
 - Colloquium at the Carnegie Observatories, Pasadena, CA (11/25/03). “The dark halos of early-type galaxies and the Hubble Constant”
 - Colloquium at the University of California, Los Angeles, CA (11/05/03). “Clusters of galaxies in a hierarchical Universe: dark matter halos and environmental processes”
 - Colloquium at the University of California, Santa Barbara, CA (10/08/03). “Clusters of galaxies in a hierarchical Universe: dark matter halos and environmental processes”
 - Colloquium at the University of Bologna, Bologna, Italy (09/18/03) “The dark halos of early-type galaxies and the Hubble constant”
 - Cosmology Seminar at the University of California at Davis, CA, “The dark matter halos of high-redshift spheroids: universal profiles and the Hubble constant” (05/29/03)
 - Invited review at the Carnegie Centennial Symposium “Clusters of galaxies: probes of cosmological structure and galaxy evolution”, Pasadena, CA, “The formation of early-type galaxies” (01/30/03)
 - Colloquium at the Trieste Observatory, Trieste, Italy, “High-z early-type galaxies: mass and light” (12/20/2002)
 - Colloquium at the Padova Observatory, Padova, Italy, “High-z early-type galaxies: mass and light” (12/19/2002)
 - Colloquium at the Livermore National Laboratory, CA. “The formation and evolution of field early-type galaxies” (12/07/01)
 - Colloquium at the University of Milan, Italy “On the evolution of galaxies over the past 7 billion years” (06/22/01)
 - Colloquium at the Bologna Observatory, Bologna, Italy: “On the formation and evolution of early-type galaxies” (10/03/00)
 - Colloquium at the Arcetri Observatory, Florence, Italy: “Elliptical galaxies at intermediate redshift as a cosmological tool” (3/3/98)

- Public Lecture “Galileo, the Universe and God”, Santa Barbara CA, (11/12/09)
- Plous Award public lecture “Dark Matter and black holes over cosmic time”, Santa Barbara, CA, (12/3/09)
- Public Lecture “Origins of the Cosmos: A Dialog Between Scientists and Humanists”, Santa Barbara, CA, (5/11/08)
- Press Release HST/Chandra: “A Clash of Clusters Provides Another Clue to Dark Matter” (8/27/08)
 - <http://hubblesite.org/newscenter/archive/releases/2008/32/>
 - http://www.nasa.gov/mission_pages/chandra/news/08-111.html
- Press Release IfA: “SLACS finds 70 gravitational lens galaxies”. (7/21/08).
 - <http://www.ifa.hawaii.edu/info/press-releases/Bolton7-08/>
- Press Release HST/UCSB: “A double Einstein Ring”. (1/10/08).
 - <http://hubblesite.org/newscenter/archive/releases/2008/04/>
- Press Release UCSB/HST/Keck: “Scientists identify and weigh distant tiny galaxy”. (10/04/07).
 - <http://www.ia.ucsb.edu/pa/display.aspx?pkey=1660>
 - <http://hubblesite.org/newscenter/archive/releases/2007/38/>
- Press release NASA/ESA: “Hubble, Sloan quadruple number of known optical Einstein Rings” (11/17/05).
 - <http://hubblesite.org/newscenter/newsdesk/archive/releases/2005/32/>
- Press Release ESA/NASA: “Hubble tracks down a galaxy cluster’s dark matter” (07/17/03)
 - <http://www.sci.esa.int/science-e/www/object/index.cfm?fobjectid=33507>
- Press Release ESO: “An Extremely Red Galaxy” (11/26/98).
 - <http://www.eso.org/outreach/press-rel/pr-1998/pr-20-98.html>

Approved Observing Proposals (PI):

- **2009B. UC:** Measuring stellar and dark matter in disk galaxies with kinematics and strong lensing. KeckII-NIRC2, 1 night
- **2009B. UC:** The Mbh-sigma relation of active galaxies in the local Universe: spatially resolved kinematics of high mass black hole hosts. Keck1-LRIS 2nights.
- **2009. HST: GO-11978.** Luminous and dark matter in disk galaxies from strong lensing and stellar kinematics. 91 orbits
- **2009A. UC:** The Mbh-sigma relation of active galaxies in the local Universe: spatially

- resolved kinematics of high mass black hole hosts. KeckI-LRIS, 1.5 nights
- **2009A. UC:** Measuring stellar and dark matter in disk galaxies with kinematics and strong lensing. KeckI-LRIS + KeckII-NIRC2, 2 nights
 - **2008. XMM: 060234.** X-raying strong gravitational lenses: dark halos and the environment.
 - **2008. HST: GO-11701.** The “jackpot” in technicolor: photometric redshift and mass to light decomposition of a double Einstein Ring. 3 orbits
 - **2008B. UC:** The M-sigma relation: mass dependency and redshift evolution. KeckI-LRIS, 3 nights
 - **2008A. UC:** The duty cycle of supermassive black holes: velocity dispersions and nuclear luminosity of Virgo spheroidals. KeckI-LRIS, 1 night
 - **2008A. UC:** The m-sigma relation: mass dependency and redshift evolution. KeckI-LRIS, 2 nights
 - **2007B. UC:** Dark matter halos over cosmic time. KeckI-LRIS, 2 nights
 - **2007B. UC:** High redshift gravitational lenses with LGS-AO imaging. KeckII-NIRC2, 2 nights
 - **2007. HST: GO-11208.** The co-evolution of spheroids and black holes in the last six billion years. 30 orbits
 - **2006. Chandra/Spitzer.** The Duty Cycle of Supermassive Black Holes: X-raying Virgo. Large Program. 453.6ks (Chandra) + 9.5 hrs MIPS
 - **2006B. UC:** Mass and light in distant early-type galaxies. KeckI-LRIS, 2 nights
 - **2006B. UC:** Using gravitational telescopes to super-resolve the 2D kinematics of distant galaxies. KeckII-OSIRIS, 1 night
 - **2006A. UC:** Mass and light in distant early-type galaxies. KeckI-LRIS, 2 nights
 - **2006A. UC:** Strong lensing in the laser guide star era: kinematics of Einstein Rings. KeckII-OSIRIS, 0.5 nights
 - **2005B. UC:** Mass and light in distant early-type galaxies. KeckII-ESI, 2 nights
 - **2004. GALEX: GO-22:** A wide-field UV study of two $z \sim 0.5$ clusters. 45ks
 - **2004. HST: GO-10216:** Co-evolution of spheroids and black holes. 20 orbits
 - **2004. ESO: 74.A-0158** Stellar dynamics and time delays of gravitational lens galaxies; the road to H0. VLT-FORS2, 18 hrs
 - **2003. HST: AR-12-9960:** The Lenses Structure and Dynamics (LSD) Survey: mass distribution and stellar populations of high redshift E/S0 galaxies
 - **2003-2004. UC:** Reverberation mapping at $z=0.37$: absolute calibration of high-redshift black hole masses. Lick-Shane 3m, 10+10 nights (jointly with Matthew Malkan)
 - **2003. CIT:** Redshift evolution of the black-hole mass-sigma relation. Keck-LRIS, 3 nights
 - **2003. CIT:** Ultra deep mid and far UV photometry of high-z cluster E/S0 galaxies: the origin

- of the UV upturn. KeckI-LRIS, 2 nights
- **2003. ESO:** 71.A-0364 Stellar dynamics and time delays of gravitational lens galaxies; the road to H α . VLT-FORS2, 21.4 hrs
 - **2002. HST:** AR-11-9527: The distribution of dark matter in cD galaxies with giant arcs: combining kinematic and lensing tracers
 - **2002. CIT:** The Lens Structure and Dynamics Survey III: internal kinematics of a significant sample of gravitational lenses. KeckII-ESI, 3 nights
 - **2002. CIT:** The internal structure of early-type galaxies: the fundamental plane and extended kinematic profiles of gravitational lenses. KeckII-ESI, 2 nights
 - **2002. ESO:** 69.B-0392 The origin of [OII] emission in intermediate redshift massive early-type galaxies. VLT-ISAAC, 2.5 hrs
 - **2001. HST:** AR-10-9222: The Fundamental Plane of field early-type galaxies from $z \sim 0.7$ to $z=0$.
 - **2001. CIT:** The structure and dynamics of cD galaxies. KeckII-ESI, 1 night
 - **2001. CIT:** Luminous and dark matter in early-type galaxies: extended kinematic profiles of gravitational lenses. KeckII-ESI, 2 nights
 - **2000. ESO:** 66.A-0362 Spectroscopy of an HST selected sample of distant field ellipticals. VLT-FORS2, 22.5 hrs
 - **2000. ESO:** 65.O-0446 Spectroscopy of an HST selected sample of distant field ellipticals. VLT-FORS2, 7.5 hrs
 - **2000. ESO:** 65.O-0448 The nature of Extremely Red Objects. NTT-SUSI2, 3 nights
 - **1999. ESO:** 64.O-0281 Spectroscopy of an HST selected sample of distant field ellipticals. 3.6m-EFOOSC2, 4 nights
 - **1999. ESO:** 64.O-0277 The nature of Extremely Red Objects: optical follow-up of the NICMOS parallels in the Southern Sky. NTT-SUSI2, 2 nights
 - **1999. ESO:** 63.O-0468 Spectroscopy of an HST selected sample of distant field ellipticals. 3.6m-EFOOSC2, 3 nights
 - **1998. ESO:** 62.O-0592 Spectroscopy of an HST selected sample of distant field ellipticals. 3.6m-EFOOSC2, 2 nights

Approved Observing Proposals (CoI):

- **2009. Chandra:** Accretion onto nuclear black holes in early-type galaxies: comparing field vs clusters. PI: Elena Gallo
- **2009A. CIT:** Dynamical masses for $z > 1$ galaxies: understanding the assembly history of

- spiral and elliptical galaxies. PI: Richard Ellis, 3 nights
- **2009A. UC:** The Lick AGN monitoring project: stellar velocity dispersions. PI: Aaron Barth. 1 night
 - **2008. HST-GO-11588:** Galaxy-scale strong lenses from the CFHT Legacy Survey. PI: Raphael Gavazzi
 - **2008. HST-GO-11662:** Improving the radius-luminosity relation for broad lined AGN with a new reverberation sample. PI: Misty Bentz
 - **2008. HST-GO-11700:** Bright galaxies at $z > 7.5$ with a WFC3 Pure Parallel Survey. PI: Michele Trenti. 142 targets
 - **2008B. UC:** Measuring Stellar and Dark Matter in Disk Galaxies with Kinematics and Strong Gravitational Lensing. PI: David Koo. Keck I+II, 3 nights
 - **2008A. CIT:** Deep UV Photometry of cluster E/S0. PI: Richard Ellis, KeckI-LRIS, 3 nights
 - **2007B. UC:** The M - σ relation: mass dependency and redshift evolution. PI: Matt Malkan. KeckI-LRIS, 2 nights
 - **2007B. CIT:** The assembly history of galactic bulges. PI: Richard Ellis. KeckII-DEIMOS, 4 nights
 - **2007B. CIT:** A precise measure of the distribution of dark matter in clusters. PI: Richard Ellis. Subaru-Suprime Camera, 2 nights
 - **2007. Chandra/HST/Spitzer/09700252.** Lower luminosity AGNs at cosmologically interesting redshifts: SEDs and accretion rates of $z=0.36$ Seyferts. PI: Sarah Gallagher. 92.90ks (chandra) + 7 orbits (HST) + 11hrs (SSC)
 - **2007. HST: AR-11246:** Evolution in the dark matter properties of strong lenses through weak lensing. PI: Chris Fassnacht
 - **2007. HST: AR-11252:** Ultraluminous X-ray sources in elliptical galaxies and the X-ray binary/globular cluster connection. PI: Elena Gallo
 - **2007. HST: GO-11099:** A silver bullet for the sources of reionization. PI: Marusa Bradac. 42 orbits.
 - **2007. HST: GO-11202:** The structure of early-type galaxies: 0.1-100 effective radii. PI: Leon Koopmans. 159 orbits (US PI: Treu)
 - **2007. HST: GO-11100:** Two new bullets for MOND: revealing the properties of dark matter in massive merging clusters. PI: Marusa Bradac. 23 orbits
 - **2007. HST: GO-11166:** The mass dependent evolution of the black hole bulge relations. PI Jonghak Woo. 14 orbits
 - **2006. GALEX: GO-117:** The Effect of Substructure on the Star Formation Histories of Cluster Galaxies. PI: Richard Ellis.
 - **2007A. UC:** The black hole mass- σ relation at $z=0.36$ over two decades in black hole

- mass. PI: Matt Malkan. KeckI-LRIS, 2 nights
- **2007A. CIT:** The origin of S0 galaxies and the mass assembly history of bulges. PI: Richard Ellis. KeckII-DEIMOS, 4 nights
 - **2007AB. CIT:** Bulge formation: unraveling the mysteries. PI: Lauren MacArthur. Palomar-DSPEC, 18 nights
 - **2006B. UC:** Evolution of the black hole mass sigma relation. PI: Matt Malkan. KeckI-LRIS, 3 nights.
 - **2006. Spitzer:** IRS spectroscopy of LIRGs in the cluster Cl0024+16 at $z=0.4$. PI: James Geach.
 - **2006. Spitzer: MIPS:** Obscured activity and environment: a 24um survey of two well-studied clusters at $z\sim 0.5$. PI Ian Smail.
 - **2006. HST: GO-10886:** The Sloan Lens ACS Survey: Towards 100 New Strong Lenses. PI: Adam Bolton
 - **2006. HST: GO-10798:** Dark Halos and Substructure from Arcs & Einstein Rings. PI: Leon Koopmans; (Treu US PI)
 - **2006. HST: AR-10986:** Testing the coevolution of black holes and massive host galaxies to $z=1.5$. PI: Jonghak Woo
 - **2006A. UC.** Evolution of the black hole mass sigma relation. PI: Matt Malkan. KeckII-NIR-SPEC, 1 night
 - **2005. ESO:** Probing galaxy structure and evolution through two-dimensional stellar kinematics of lens galaxies. PI: Leon Koopmans. VLT-VIMOS, 108hrs
 - **2005B. UC:** Evolution of the black-hole mass sigma relation. PI: Matt Malkan. KeckI+LRIS, 2 nights.
 - **2005-2006. TMT:** IRIS (Infrared Imaging Spectrograph). An instrument feasibility proposal to the thirty meter telescope project. PI: James Larkin
 - **2005. HST: GO-14-10587:** Measuring the mass dependence of early-type galaxy structure; PI Adam Bolton
 - **2005. HST: GO-14-10494:** Imaging the mass structure of distant lens galaxies; PI Leon Koopmans (Treu US PI)
 - **2005. ESO-075.B-0226(A):** The structure and evolution of early-type galaxies from lensing and dynamics; PI Leon Koopmans
 - **2005A. UC:** Evolution of the black-hole mass sigma relation. PI: Matt Malkan. Keck+LRIS, 2 nights.
 - **2004. Spitzer:** P3143: A Panoramic 24-um/HST Survey for Obscured Activity in Clusters at $z\sim 0.5$. PI: Ian Smail
 - **2004. HST: AR-13-10293.** The Assembly History of Disks and Bulges out to $z=1$. PI: Rich-

ard Ellis

- **2004. HST:** GO-13-10174. Dark-matter halos and evolution of high- z early-type galaxies. PI: Leon Koopmans
- **2004. HST:** GO-13-10158. ACS Observations of the Gravitational Lens B1608+656: Characterizing the Einstein Ring. PI: Chris Fassnacht
- **2004. CIT:** The assembly history of disk galaxies. PI: Richard Ellis, KeckII-DEIMOS, 3 nights
- **2004. CIT:** The role of dark matter and intracluster medium in galaxy formation and cluster evolution. PI: Richard Ellis, KeckII-DEIMOS, 3 nights
- **2003. Chandra.**05800764: The dark matter halo and baryonic content of galaxy clusters. PI: Richard Ellis
- **2003. HST:** GO-12-9836 : The role of dark matter and intracluster gas in galaxy formation and cluster evolution. PI: Richard Ellis
- **2003. HST:** AR-12-9920: The mass assembly history of early-type galaxies at $z\sim 1$. PI: Richard Ellis
- **2003. UC:** Evolution of the black-hole mass sigma relation. PI: Matt Malkan. Keck+LRIS, 2 nights.
- **2003. UC:** Gravitational Lens Dynamics and the Hubble Constant. PI: Chris Fassnacht. Keck+LRIS, 1 night
- **2003. CIT:** The assembly history of disk galaxies. PI: Richard Ellis, KeckII-DEIMOS, 4 nights
- **2003. CIT:** The role of dark matter and intracluster medium in galaxy formation and cluster evolution. PI: Richard Ellis, KeckII-DEIMOS, 4 nights
- **2002. CIT:** The dark matter distribution in lensing clusters: testing the CDM paradigm cD. PI: Richard Ellis. KeckII-ESI, 2 nights
- **2002. CIT:** Measuring the cosmological parameters using massive cluster lenses. PI: Roger Blandford, KeckI-LRIS, 2 nights
- **2002. CIT:** The DEEP2 Survey: The mass assembly history of $z\sim 1$ spheroidal galaxies. PI: Richard Ellis, KeckII-DEIMOS, 5 nights
- **2002. CIT:** The distribution of dark matter in cD galaxies with giant arcs: combining lensing and kinematic tracers. PI: Richard Ellis, KeckI-LRIS, 2 nights
- **2002. CIT:** Detailed spectroscopic and morphological studies of galaxies to the periphery of the rich cluster C10024+16 ($z=0.4$). PI: Richard Ellis, KeckII-DEIMOS, 4 nights
- **2001. CIT:** The distribution of Dark Matter in cD galaxies with giant arcs: kinematic and lensing tracers. PI: Richard Ellis. KeckII-ESI, 2 nights
- **2001. CIT:** A detailed spectroscopic and morphological study of galaxies to the periphery of

the rich cluster CL0024 ($z=0.4$). PI: Richard Ellis. KeckI-LRIS, 3 nights

- **2001. ESO:** 67.A-0269 The metallicity and dust content of $z=2.4$ galaxies. PI: Massimo Stiavelli. VLT-ISAAC, 3 nights
- **2000. ESO:** 66.A-0701 The galaxy population of the most distant massive clusters and their internal dynamics. PI: Piero Rosati. VLT-FORS2 and VLT-ISAAC. Large Programme
- **1999. ESO:** 64.O-0298 Studying the evolution of cluster elliptical galaxies: the Fundamental Plane at $z=0.58$. PI: Massimo Stiavelli. VLT-UT1-FORS1, 3 half nights
- **1999. ESO:** 63.O-0591 Studying the evolution of cluster elliptical galaxies: the Fundamental Plane at $z=0.58$. PI: Massimo Stiavelli. VLT-UT1-FORS1, 2 half nights