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Michele Cappellari

Stéphane Courteau

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GALAXIES MASSES AS CONSTRAINTS OF FORMATION MODELS

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COVER ILLUSTRATION: CONFERENCE POSTER

The cover picture is the official conference poster for the IAU Symposium 311. It shows the face-on spiral galaxy NGC 1232 looking down on the colleges in Oxford UK, where the conference was held.

This choice of a spiral galaxy reminds us of the first targets for which galaxy masses were first measured in the sixties from major axis rotation curves. This matches our conference theme which addresses the interplay between galaxy masses and galaxy evolution.

The spiral galaxy image was taken at ESO. The Oxford skyline is by former Oxford student Joseph Caruana and is reproduced with permission. The poster was designed by Oxford graduate student Shravan Shetty.

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*Institut d'Astrophysique de Paris,
98bis, Bd Arago, 75014 Paris, France
montmerle@iap.fr*

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*University of Padua, Dept of Physics and Astronomy,
Vicolo dell'Osservatorio, 3, 35122 Padova, Italy
piro.benvenuti@unipd.it*

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GALAXIES MASSES AS CONSTRAINTS OF FORMATION MODELS

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Edited by

MICHELE CAPPELLARI

*Sub-department of Astrophysics, Department of Physics, University of Oxford,
Denys Wilkinson Building, Keble Road, Oxford OX1 3RH, UK*

and

STÉPHANE COURTEAU

*Queen's University, Department of Physics, Engineering Physics and
Astronomy, Kingston, Ontario, Canada K7L 3N6*



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Preface

In the era of precision cosmology, we think we can accurately predict the distribution of dark matter in the Universe. However the impact of baryonic physics is still largely unknown and our understanding of galaxy formation must rely on observations. A key advance in recent years has been the ability to enrich studies of the luminosity evolution of galaxies with determinations of their stellar or total masses from dynamical analyses using stellar populations, stellar or gaseous dynamical models, weak or strong lensing. Contrary to the light distribution alone, the distribution of both the stellar and dark matter in galaxies can be robustly compared to galaxy formation models.

Dynamical studies of galaxies near and far have evolved from modelling the mass distribution of individual objects to capitalizing on large surveys using integral field and multi-object spectroscopy, strong or weak gravitational lensing, planetary nebulae, stellar and gas kinematics, and multi-wavelength studies, to constrain masses from the stellar population. Much of this progress has relied on key instrumentation developments. For instance, new spectrographs optimized to near-infrared wavelengths now better trace the rest-frame visual spectra of distant galaxies. Massive multi-objects capabilities also allow larger samples to be obtained in feasible exposure times. In the foreseeable future, 30–40-m class telescopes, the LSST survey and JWST and EUCLID missions promise to extend our studies of galaxy masses and kinematics of nearby galaxies up to redshift $z \sim 2$ and beyond, where most of the galaxy assembly has taken place.

This symposium aims at bringing together galaxy evolution theorists, observers of the nearby and distant universe, and instrumentation specialists. We must identify what key observables can be robustly reproduced by the models, how the existing and new instrumentation should be optimized for galaxy evolution studies, and what future observations would be most useful to constrain the models.

This Symposium was also an opportunity to celebrate the illustrious career of Prof. Roger Davies.

*Michele Cappellari and Stéphane Courteau, co-chairs SOC
Oxford and Kingston, 1 January, 2015*

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CONFERENCE PHOTOGRAPH



Participants

- Roberto **Abraham**, University of Toronto, CANADA
 Louis **Abramson**, University of Chicago, USA
 Padraic **Alton**, Durham University, UK
 Josh **Argyle**, University of St. Andrews, UK
 Nobuo **Arimoto**, Subaru Telescope, NAOJ, Hawaii
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 Rachel **Bezanson**, University of Arizona/Steward Observatory, USA
 James **Binney**, University of Oxford, UK
 Joss **Bland Hawthorn**, University of Sydney, AUSTRALIA
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 Ana **Bonaca**, Yale University, USA
 Jo **Bovy**, Institute for Advanced Study, USA
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 Margot **Brouwer**, Leiden Observatory, The Netherlands
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 James **Bullock**, UC Irvine, USA
 Kevin **Bundy**, Kavli IPMU, JAPAN
 David **Buote**, University of California - Irvine, USA
 Martin **Bureau**, University of Oxford, UK
 Marcello **Cacciato**, Leiden Observatory, The Netherlands
 Michele **Cappellari**, University of Oxford, UK
 Maria **Cebrian Renau**, Instituto de Astrofísica de Canarias, SPAIN
 Gilles **Chabrier**, ENS-Lyon, FRANCE
 Aldée **Charbonnier**, Universidade Federal do Rio de Janeiro (UFRJ), BRAZIL
 Stéphane **Charlot**, Institut d'Astrophysique de Paris, FRANCE
 Yanping **Chen**, New York University Abu Dhabi (NYUAD), UNITED ARAB EMIRATES
 Charlie **Conroy**, University of California - Santa Cruz, USA
 Guido **Consolandi**, University of Milano Bicocca, ITALY
 Arianna **Cortesi**, IAG-USP, BRAZIL
 Stéphane **Courteau**, Queen's University, CANADA
 Scott **Croom**, University of Sydney, AUSTRALIA
 Emanuele **Daddi**, CEA Saclay, FRANCE
 Iary **Davidzon**, Università di Bologna, ITALY
 Roger **Davies**, University of Oxford, UK
 Timothy **Davis**, European Southern Observatory, GERMANY
 Roelof **de Jong**, Leibniz-Institut für Astrophysik Potsdam (AIP), GERMANY
 Adriana **de Lorenzo-Cáceres**, University of St. Andrews, UK
 Avishai **Dekel**, The Hebrew University of Jerusalem, ISRAEL
 Denedikt **Diemer**, University of Chicago / KICP, USA
 Alan **Dressler**, Carnegie Observatories, USA
 Richard **D'Souza**, Max Plank Institute for Astrophysics, GERMANY
 Pierre-Alain **Duc**, AIM Paris - Saclay, FRANCE
 Aaron **Dutton**, Max Planck Institute for Astronomy, GERMANY
 Sandra **Faber**, University of California Observatories, USA
 Jesus **Falcon-Barroso**, Instituto de Astrofísica de Canarias, SPAIN
 Michael **Fall**, STScI, USA
 Anna **Ferré-Mateu**, Subaru Telescope, USA
 Duncan **Forbes**, Swinburne University, AUSTRALIA
 Francesca **Fragkoudi**, LAM, FRANCE
 Carols **Frenk**, ICC - Durham, UK
 Jay **Frogel**, Galaxies Unlimited and World Images, USA
 Dimitri **Gadotti**, European Southern Observatory, CHILE
 Anna **Gallazzi**, INAF-Osservatorio Astrofisico di Arcetri, ITALY
 Reinhard **Genzel**, Max Planck Institute for Extraterrestrial Physics, GERMANY
 Ortwin **Gerhard**, MPE, GERMANY
 Boris **Haeussler**, University of Oxford, UK
 Peter **Hague**, University of Leicester, UK
 Claire **Halliday**, FRANCE
 Jiaxin **Han**, ICC - Durham University, UK
 David **Hanes**, Queen's University, CANADA
 Kohei **Hayashi**, Tohoku University, JAPAN
 Amina **Helmi**, Kapteyn Institute, The Netherlands
 Maren **Hempel**, Pontificia Universidad Católica de Chile, CHILE
 Ana **Hidalgo-Gómez**, Escuela Superior de Física y Matemáticas - IPN, MEXICO
 Michaela **Hirschmann**, INAF-Trieste/IAP-Paris, ITALY
 Henk **Hoekstra**, Leiden Observatory, The Netherlands
 Ryan **Houghton**, University of Oxford, UK
 Mei-Ling **Huang**, Max-Planck Institute for Astrophysics, GERMANY
 Mike **Hudson**, University of Waterloo, USA
 Marc **Huertas-Company**, Paris Observatory, FRANCE
 Wako **Ishibashi**, ETH Zurich Institute for Astronomy, SWITZERLAND
 Prajwal **Kaffe**, The University of Sydney, AUSTRALIA
 Emin **Karabal**, ESO / Cea Saclay, FRANCE
 Susan **Kassin**, Space Telescope Science Institute, USA
 Guinevere **Kauffmann**, Max Planck Institute for Astrophysics, GERMANY
 Sugata **Kaviraj**, University of Hertfordshire, UK
 Sarah **Kendrew**, University of Oxford, Oxford, UK
 Chiaki **Kobayashi**, University of Hertfordshire, UK
 John **Kormendy**, University of Texas at Austin, USA
 Davor **Krajinovic**, Leibniz-Institut für Astrophysik Potsdam (AIP), GERMANY
 Mariska **Kreik**, UC Berkeley, USA
 abraham@astro.utoronto.ca
 labramson@uchicago.edu
 padraig.alton@durham.ac.uk
 ja66@st-andrews.ac.uk
 arimoto@naoj.org
 marnabol@eso.org
 rmb@obs.univ-lyon1.fr
 pbehroozi@gmail.com
 beffori@mpe.mpg.de
 sirio@astro.caltech.edu
 rbezanson@email.arizona.edu
 binney@thphys.ox.ac.uk
 jbh@physics.usyd.edu.au
 abluck@uvic.ca
 nfb@st-andrews.ac.uk
 ana.bonaca@yale.edu
 bovy@ias.edu
 jbrodie@ucsc.edu
 margot.brouwer@gmail.com
 s.w.buchan@soton.ac.uk
 bullock@uci.edu
 kevin.bundy@ipmu.jp
 buote@uci.edu
 bureau@astro.ox.ac.uk
 cacciato@strw.leidenuniv.nl
 cappellari@astro.ox.ac.uk
 mcebrian@iac.es
 chabrier@ens-lyon.fr
 charbonnier@astro.ufrj.br
 charlot@iap.fr
 chenyp.astro@gmail.com
 conroy@ucsc.edu
 guido.consolandi@mib.infn.it
 aricorte@gmail.com
 courteau@astro.queensu.ca
 scroom@physics.usyd.edu.au
 edaddi@cea.fr
 iary.davidzon@unibo.it
 rld@astro.ox.ac.uk
 tdavis@eso.org
 rdejong@aip.de
 adlcr@st-andrews.ac.uk
 ekel@huji.ac.il
 bdiemer@oddjob.uchicago.edu
 dressler@obs.carnegiescience.edu
 rdsouza@mpa-garching.mpg.de
 paduc@cea.fr
 dutton@mpia.de
 faber@ucolick.org
 jfallcon@iac.es
 fall@stsci.edu
 aferre@naoj.org
 dforbes@swin.edu.au
 francesca.fragkoudi@lam.fr
 c.s.frenk@durham.ac.uk
 jayfrogel@me.com
 dgadotti@eso.org
 gallazzi@arcetri.astro.it
 genzel@mpe.mpg.de
 gerhard@mpe.mpg.de
 BorisHaeussler.astro@gmail.com
 peter.hague@le.ac.uk
 claire.halliday@free.fr
 hanjiaxin@gmail.com
 hanes@astro.queensu.ca
 k.hayasi@astr.tohoku.ac.jp
 ahelmi@astro.rug.nl
 maren551@gmail.com
 ahidalgo@esfm.ipn.mx
 mhirsch@oats.inaf.it
 hoekstra@strw.leidenuniv.nl
 rcwh@astro.ox.ac.uk
 mlhuang@MPA-Garching.MPG.DE
 mjudson@uwaterloo.ca
 marc.huertas@obspm.fr
 wako.ishibashi@phys.ethz.ch
 p.kaffe@physics.usyd.edu.au
 karabalemin@gmail.com
 kassin@Stsci.edu
 gamk@mpa-garching.mpg.de
 s.kaviraj@herts.ac.uk
 sarah.kendrew@astro.ox.ac.uk
 c.kobayashi@herts.ac.uk
 kormendy@astro.as.utexas.edu
 davor@aip.de
 mkriek@berkeley.edu

- Ulrike **Kuchner**, University of Vienna, AUSTRIA
 Harald **Kuntschner**, ESO, GERMANY
 Francesco **La Barbera**, INAF-OAC, ITALY
 Claire **Lackner**, Kavli IPMU, JAPAN
 Chervin **Laporte**, Max Planck Institute for Astrophysics, GERMANY
 Ronald **Lasker**, MPA, GERMANY
 Alexie **Leauthaud**, Kavli IPMU, JAPAN
 Federico **Lelli**, Case Western Reserve University, USA
 Timothy **Licquia**, University of Pittsburgh, USA
 Richard **Long**, NAO, UK
 Alessia **Longobardi**, Max Planck Institute for extraterrestrial Physics, GERMANY
 John **Lucey**, Durham University, UK
 Donald **Lynden-Bell**, IOA - Cambridge, UK
 Natalya **Lyskova**, Max Planck Institute for Astrophysics, GERMANY
 Mariya **Lyubanova**, Kapteyn Astronomical Institute, The Netherlands
 John **Magorrian**, University of Oxford, UK
 Millicent **Maier**, Australian Astronomical Observatory, AUSTRALIA
 Gary **Mamon**, IAP, FRANCE
 Alison **Wing Shan Man**, Dark Cosmology Centre - Niels Bohr Institute, DENMARK
 Rachel **Mandelbaum**, Carnegie Mellon University, USA
 Nir **Mandelker**, Hebrew University of Jerusalem, ISRAEL
 Claudia **Marston**, ICG-University of Portsmouth, UK
 Danilo **Marchesini**, Tufts University, USA
 Ignacio **Martan Navarro**, Instituto de Astrofísica de Canarias, SPAIN
 Charlotte **Mason**, University of California - Santa Barbara, USA
 Richard **McDermid**, Macquarie University / AAO, AUSTRALIA
 Robert **McMahon**, Kettering University, USA
 Jairo **Mendez Abreu**, University of St. Andrews, UK
 Sarah **Miller**, University of California - Irvine, USA
 Carl **Mitchell**, Rutgers - The State University of New Jersey, USA
 Peter **Mitchell**, Durham University, UK
 Takahiro **Morshita**, Astronomical Institute of Tohoku University, JAPAN
 Laura **Morselli**, Excellence Cluster, GERMANY
 Matt **Mountain**, Space Telescope Science Institute, USA
 Adam **Muzzin**, Leiden Observatory, The Netherlands
 Julio **Navarro**, University of Victoria, CANADA
 Andrea **Negri**, Università di Bologna, ITALY
 Alberto **Nigoche-Netro**, Universidad de Guadalajara, MEXICO
 Carlo **Nipoti**, Università di Bologna, ITALY
 Go **Ogiya**, University of Tsukuba, GERMANY
 Kyoko **Onishi**, The Graduate University for Advanced Studies/NAOJ, JAPAN
 Nathalie **Ouellette**, Queen's University, CANADA
 Milena **Pawlik**, University of St. Andrews, UK
 Reynier **Peletier**, Kapteyn Astronomical Institute, The Netherlands
 Arriba Luis de **Peralta**, Instituto de Astrofísica de Canarias, SPAIN
 Pablo **Pérez-González**, Universidad Complutense de Madrid, SPAIN
 Gabriele **Pezzulli**, Università di Bologna, ITALY
 Silvia **Posacki**, Università di Bologna, ITALY
 Lorenzo **Posti**, Università di Bologna, ITALY
 Rhea-Silvia **Remus**, University Observatory Munich, GERMANY
 Alvio **Renzini**, INAF-Osservatorio Astronomico di Padova, ITALY
 Joel **Roediger**, University of California - Santa Cruz, USA
 Aaron **Romanowsky**, San Jose State University, USA
 Martin **Sahlan**, University of Oxford, SWEDEN
 Amélie **Saintonge**, UCL, UK
 Marc **Sarzi**, University of Hertfordshire, UK
 Till **Sawala**, Institute for Computational Cosmology - Durham, UK
 Matthieu **Challer**, Institute for Computational Cosmology - Durham, UK
 Paul **Schechter**, MIT Kavli Institute, USA
 Ricardo **Schiavon**, Astrophysics Research Institute - LJMU, UK
 Nicholas **Scott**, The University of Sydney, AUSTRALIA
 Marja **Seidel**, Instituto de Astrofísica de Canarias, SPAIN
 Francesco **Shankar**, University of Southampton, UK
 Shrvan **Shetty**, University of Oxford, UK
 Jonathan **Sick**, Queen's University, CANADA
 Raymond **Simons**, Johns Hopkins University, USA
 Russell **Smith**, University of Durham, UK
 Chiara **Spinello**, Max-Planck-Institut für Astrophysik (MPA), GERMANY
 Chuck **Steidel**, Caltech, USA
 Massimo **Stiavelli**, Space Telescope Science Institute, USA
 Trinidad **Tapia**, Universidad Nacional Autónoma de México, MEXICO
 James **Taylor**, University of Waterloo, CANADA
 Matthew **Taylor**, Pontificia Universidad Católica de Chile, CHILE
 Philip **Taylor**, University of Hertfordshire, UK
 Niranjan **Thatte**, University of Oxford, UK
 Daniel **Thomas**, University of Portsmouth, UK
 Jens **Thomas**, Max-Planck Institute for Extraterrestrial Physics, GERMANY
 Alfred **Tiley**, University of Oxford, UK
 Tommaso **Treu**, University of California - Los Angeles, USA
 Ignacio **Trujillo**, Instituto de Astrofísica de Canarias, SPAIN
 Athanasia **Tsati**, MPA, GERMANY
 Glenn **van de Ven**, MPA, GERMANY
 Frank **van den Bosch**, Yale University, USA
 Remco **van den Bosch**, MPA, GERMANY
 Roeland **van der Marel**, STScI, USA
 Pieter **van Dokkum**, Yale University, USA
 Edo **van Uitert**, Argelander Institute for Astronomy, GERMANY
 Alexandar **Vazdekis**, Instituto de Astrofísica de Canarias, SPAIN
 Marc **Verheijen**, Kapteyn Astronomical Institute, The Netherlands
 Aprajita **Verma**, University of Oxford, UK
 ulrike.kuchner@univie.ac.at
 hkuntsch@eso.org
 labarber@na.astro.it
 claire.lackner@ipmu.jp
 cfp12@mpa-garching.mpg.de
 laesker@mpia.de
 alexie.leauthaud@ipmu.jp
 federico.elli@case.edu
 tcl15@pitt.edu
 rjl2007@gmail.com
 alongobardi@mpe.mpg.de
 john.lucey@durham.ac.uk
 dlb@ast.cam.ac.uk
 lyskova@mpa-garching.mpg.de
 lyubanova@astro.rug.nl
 magog@thphys.ox.ac.uk
 mmaier@aao.gov.au
 gam@iap.fr
 allison@dark-cosmology.dk
 rmandelb@andrew.cmu.edu
 nir.mandelker@mail.huji.ac.il
 claudia.marston@port.ac.uk
 danilo.marchesini@tufts.edu
 imartin@iac.es
 cmason@physics.ucsb.edu
 richard.mcdermid@mq.edu.au
 mcmahan@kettering.edu
 jma20@st-andrews.ac.uk
 shmiller@uci.edu
 cmitchell@physics.rutgers.edu
 peter.mitchell@durham.ac.uk
 mtakahiro@astr.tohoku.ac.jp
 laura.morselli@tum.de
 mmountain@stsci.edu
 muzzin@strw.leidenuniv.nl
 jfn@uvic.ca
 andrea.negri@unibo.it
 anigoche@gmail.com
 carlo.nipoti@unibo.it
 ogiya@ecs.tsukuba.ac.jp
 kyoko.onishi@nao.ac.jp
 nouellette@astro.queensu.ca
 mp84@st-andrews.ac.uk
 peletier@astro.rug.nl
 lperalta@iac.es
 pgperez@ucm.es
 gabriele.pezzulli@unibo.it
 silvia.posacki@unibo.it
 lorenzo.posti@unibo.it
 rhea@usm.lmu.de
 alvio.renzini@oapd.inaf.it
 joel.roediger@nrc-cnrc.gc.ca
 aaron.romanowsky@sjsu.edu
 martin.sahlan@astro.ox.ac.uk
 a.saintonge@ucl.ac.uk
 m.sarzi@herts.ac.uk
 till.sawala@durham.ac.uk
 matthieu.schaller@durham.ac.uk
 schech@mit.edu
 r.p.schiavon@ljmu.ac.uk
 nscott@physics.usyd.edu.au
 mseidel@iac.es
 F.Shankar@soton.ac.uk
 Shrvan.Shetty@astro.ox.ac.uk
 jsick@astro.queensu.ca
 rsimons@pha.jhu.edu
 russell.smith@durham.ac.uk
 spini@mpa-garching.mpg.de
 ccs@astro.caltech.edu
 mstiavel@stsci.edu
 ttapia@astro.unam.mx
 taylor@uwaterloo.ca
 mtaylor@astro.puc.cl
 p.taylor7@herts.ac.uk
 thatte@astro.ox.ac.uk
 daniel.thomas@port.ac.uk
 jthomas@mpe.mpg.de
 Alfred.Tiley@astro.ox.ac.uk
 tt@astro.ucla.edu
 trujillo@iac.es
 tsatsi@mpia.de
 glenn@mpia.de
 frank.vandenbosch@yale.edu
 bosch@mpia.de
 marel@stsci.edu
 pieter.vandokkum@yale.edu
 vuitert@astro.uni-bonn.de
 vazdekis@iac.es
 verheijen@astro.rug.nl
 averma@astro.ox.ac.uk

Massimo **Viola**, Leiden Observatory, The Netherlands

Karina **Voggel**, ESO, GERMANY

Benedetta **Vulcani**, Kavli IPMU, JAPAN

David **Wake**, The Open University, UK

Wenting **Wang**, Institute for Computational Cosmology, UK

Anne-Marie **Weijmans**, University of St. Andrews, UK

Kyle **Wesfall**, Kapteyn Astronomical Institute, The Netherlands

Simon **White**, Max-Planck-Institut für Astrophysik, GERMANY

Stephen **Wilkins**, Astronomy Centre - University of Sussex, UK

Sukyong **Yi**, Yonsei University, KOREA

Akin **Yildirim**, Max Planck Institute for Astronomy, GERMANY

Ling **Zhu**, MPA, GERMANY

Stefano **Zibetti**, INAF-Osservatorio Astrofisico di Arcetri, ITALY

Bodo **Ziegler**, University of Vienna, AUSTRIA

Simon **Zieleniewski**, University of Oxford, UK

viola@strw.leidenuniv.nl

kvoggel@eso.org

benedetta.vulcani@ipmu.jp

david.wake@open.ac.uk

bilixing.wenting@gmail.com

amw23@st-andrews.ac.uk

westfall@astro.rug.nl

swhite@mpa-garching.mpg.de

s.wilkins@sussex.ac.uk

yi@yonsei.ac.kr

yildirim@mpia.de

lzhu@mpia-hd.mpg.de

zibetti@arcetri.astro.it

bodo.ziegler@univie.ac.at

simon.zieleniewski@physics.ox.ac.uk

CONFERENCE PICTURES



Figure 1. LOC mavericks: Leanne O'Donnell (front) and Ashling Morris (back)



Figure 2. Department of Physics Martin Wood Lecture Theatre



Figure 3. Pieter van Dokkum and Mariska Kriek



Figure 4. After hours celebration dinner



Figure 5. Four of the Seven Samurai: Sandra Faber, Roger Davies, Alan Dressler, Donald Lynden-Bell



Figure 6. Roger Davies, Michele Cappellari, Roelof de Jong, Stéphane Courteau, Martin Bureau, Bodo Ziegler



Figure 7. Symposium banquet at Wadham College



Figure 8. Winners for best poster/short talk with symposium co-chairs. Missing: third winner Kyle Westfall. Stéphane Courteau, Marja Seidel, Athanasia Tsatsi, Michele Cappellari.



Figure 9. Symposium photographer Dr. Jay Frogel (World Images). Photo: Alvio Renzini



Figure 10. Roger and Yo Davies with a cake replica of the KPNO Mayall telescope. Millicent Maier is thanked for an inspiring cake selection. Photo: Stéphane Courteau