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Results for #IPMUlens

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Phil Marshall @drphilmarshall · Dec 20
All talk slides from #IPMUlens are available from indico.ipmu.jp/indico/interna…
Thanks to Oguri et al for making that, and the meeting, happen!
1

Phil Marshall @drphilmarshall · Dec 8
Suyu wraps up #IPMUlens: we thanked her, More and Oguri enthusiastically.
What a good meeting! :-)

Phil Marshall @drphilmarshall · Dec 8
Opportunities identified by the #IPMUlens participants: lensed SNe, sub-mm+lens modeler collabs, "industrial lensing", data challenges

Phil Marshall @drphilmarshall · Dec 8
Final discussion session at #IPMUlens: the senior panel members take the microphones around the room, only speaking when spoken to

Phil Marshall @drphilmarshall · Dec 8
Nightingale: randomly sampling the discretizations gives uncertainty estimate.
Precision is unaffected but few % bias corrected #IPMUlens

Phil Marshall @drphilmarshall · Dec 8
Nightingale uses nearest neighbor discretization to adapt the source model pixel grid to where the information content is highest #IPMUlens

Muslims
#aas225
#TheReflectionTour
#HollywoodBooks
Coachella
Trafalgar Square
Then Eat

Phil Marshall @drphilmarshall · Dec 8
James Nightingale has cracked the pixelation error introduced by codes using regular grids for lensed source reconstruction **#IPMUlens**

Phil Marshall @drphilmarshall · Dec 8
Gregor Seidel is upgrading his Arcfinder code to take multi-band imaging inputs. Spurious detections reduced by x6! **#IPMUlens**

Phil Marshall @drphilmarshall · Dec 8
Oguri: LSST should see ~100 resolved lensed SNe Ia, and ~1000 unresolved ones. "Bright, red SNe will almost always be lensed" **#IPMUlens**

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Phil Marshall @drphilmarshall · Dec 8
Masamune Oguri's **#IPMUlens** talk on lensed SNe was on the Quimby et al interpretation of PS1-10afx, unresolved multiple imaging of a Type !a

Phil Marshall @drphilmarshall · Dec 8
Chan's lens finding code, Chitah, is *fast:* 5 sec per multi-band cutout image set. 80% complete, 20-30% pure, Made In Taiwan **#IPMUlens**

Phil Marshall @drphilmarshall · Dec 8
Meanwhile James H. H. Chan is working on explicit automated pixel-level modeling (based on gravlens) for lensed quasar finding **#IPMUlens**

Phil Marshall @drphilmarshall · Dec 8
Agnello's problem is that blended quasar doubles/quads look like blue cloud galaxies. His ANN gets x2 catalog selection purity **#IPMUlens**

Phil Marshall @drphilmarshall · Dec 8

Adriano Agnello is "mining" for lenses in DES etc, training various machine learning methods to work on catalogs and images #IPMUlens

Phil Marshall @drphilmarshall · Dec 8

Buckley-Geer: searching for double source plane "Jackpot"-style systems, for cosmography. Collett expects ~100 of these too #IPMUlens

Phil Marshall @drphilmarshall · Dec 8

Buckley-Geer: no u-band in DES, but WISE photometry makes up for it in bright quasar selection #IPMUlens

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Phil Marshall @drphilmarshall · Dec 8

Liz Buckley-Geer reported on lens searching in the Dark Energy Survey. Expects ~100 lensed QSOs with second image brighter than 21 #IPMUlens

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Phil Marshall @drphilmarshall · Dec 8

More: both Space Warps' and SL2S' samples are incomplete, but in different ways. Human/machine partnerships are promising #IPMUlens

Phil Marshall @drphilmarshall · Dec 8

More has 2 motivations for Space Warps: higher completeness samples (enabling lens statistics) and assisting finder algorithm dev #IPMUlens

Phil Marshall @drphilmarshall · Dec 8

Anupreeta More on Space Warps: 60 new lens candidates, including faint arcs and lens galaxies that missed the SL2S cut #IPMUlens

Phil Marshall @drphilmarshall · Nov 22

Both Wardlow and Negrello emphasize that their teams are focused on source science; opportunity knocks for lens galaxy lovers! #**IPMUlens**

1

Phil Marshall @drphilmarshall · Nov 22

Wardlow: we should care about sub mm lenses! Sample is growing to few tens, wealth of follow up data is coming in #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 22

Mao asks if unknown source size/structure is important, Wardlow says the deflector structure/population is more important #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 22

Wardlow emphasizes accuracy of lens number counts prediction, speculates about possibility of cosmography with lens statistics #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 22

Wardlow: target selection is very pure, due to mag bias. 50% efficiency point is at about 100mJy #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 22

Julie Wardlow gave a very nice intro to the Herschel strong lens science program. Sources are at z=2-3 and often optically visible #**IPMUlens**

1 2

Phil Marshall @drphilmarshall · Nov 22

As if we weren't all excited enough about strong lenses after #**IPMUlens** :-) A quadruply-imaged SN in a Frontier Field astronomerstelegram.org/?read=6729

3 1

samore @s_a_more · Nov 22
If it is a typela, the Hubble frontier fields models could be tested. What magnifications do the teams predict for this SN? #IPMUlens

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samore @s_a_more · Nov 21
Lensed supernova in the frontier fields, go observe if you can:
astronomerstelegram.org/?read=6729
#IPMUlens

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Phil Marshall @drphilmarshall · Nov 21
Nightingale worries we'll miss interesting lenses not captured by training sets. Marshall: this was motivation for @SpaceWarps #IPMUlens

Phil Marshall @drphilmarshall · Nov 21
Koopmans asks, is joint cosmology analysis biased? Marshall's not sure, but suggests modeling common density fields explicitly #IPMUlens

Phil Marshall @drphilmarshall · Nov 21
Marshall: assuming uniform priors on lens model pars introduces H0 bias; hierarchical model avoids this, at no loss of precision #IPMUlens

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Phil Marshall @drphilmarshall · Nov 21
Marshall & Sonnenfeld are investigating bias in ensembles of time delay lenses: ETG self similarity vs uninformative priors #IPMUlens

Phil Marshall @drphilmarshall · Nov 21
Marshall: how to think about ensembles of lenses? Individual objects are always related, so models are naturally hierarchical #IPMUlens

Phil Marshall @drphilmarshall · Nov 21

Marshall shows plot by Rafi Kueng showing citizen lens modeling results, from his SpaghettiLens interface. "Citizens = Experts" #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Marshall: inspection of lens candidates by humans is always necessary, the only question is how many will take part @SpaceWarps #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Marshall's favorite mountain is Mt Fuji: "when I saw it I thought of the mountain of wide field imaging data coming our way" #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Marshall: catalog mining yields "targets", pixel modeling yields "candidates". "This is the convention I am imposing on you" #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Marshall: likelihood captures goodness of fit, prior captures plausibility of model. Training sets are sampled priors #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Marshall: to be a lens candidate, your data must be able to be explained by a plausible lens model #**IPMULens**

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Phil Marshall @drphilmarshall · Nov 21

Marshall: wide field imaging surveys should enable lens candidate detection and confirmation with the survey images, like in HST #**IPMULens**

Phil Marshall @drphilmarshall · Nov 21

Final day at #**IPMUlens** - lens searches, future opportunities. Marshall is first up, suggesting how to think about finding and using lenses

Phil Marshall @drphilmarshall · Nov 20

Hah! Bradac is helping us sketch out giant legacy JWST proposals - so good for us to think like a whole community! #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 20

MT @brant_robertson: "Answer depends on the mag you extrapolate to. Recombination time decreases as ~1/(1+z)^6, gets hard at z>8" #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 20

MT @brant_robertson: "The tension with CMB indicates high-z SFR may decline less rapidly than Ishigaki suggests." #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 20

Interesting to hear the tension between needing funding to do the work to make data/code public, and the incentives to do so #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 20

Discussion time! How to transmit lens models to the community? And with what relative weight? The latter is a research question #**IPMUlens**

Molly Peeples @astronomolly · Nov 20

@drphilmarshall thanks for all of the #**IPMUlens** tweets, it's been useful to see what people are talking about

2

Phil Marshall @drphilmarshall · Nov 20

Problem is the lack of ionizing UV starlight at z > 8. Treu asks, how steep would the faint end slope have to be to compensate? #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Ishigaki: this luminosity density and its evolution is in tension with the Planck reionization optical depth #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Ishigaki: observed LF implies rapid evolution in UV luminosity density between z=10 and 5, strengthening previous conclusions #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Ishigaki's dropouts agree with other teams'. He verifies them by Monte Carlo injection of mock sources, then lenses and detects #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Ishigaki wants to know if UV flux from stars in galaxies reionized the universe. He's not alone #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Masafumi Ishigaki now talking about z=5-10 luminosity function in the frontier fields - using the GLAFIC lens models #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Collett's ears pricked up: can we use galaxy sizes to help constrain the Pangloss mass model? Treu says something encouraging #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Nightingale: are these galaxies well modeled by elliptically symmetric Sersic profile light distributions? Most seem ok with this #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

For an encore, Kawamata converts L to M* to Mvir and finds the mean ratio of eff radius to virial radius is constant from z=4 to 8 #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Kawamata's 54 lensed galaxies lie on a rough z=7-8 size luminosity relation that seems to be steeper than the one at z=4-5 #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Kawamata is using the celebrated GLAFIC mass model to fit Sersic surface brightness models in the source planes, as one should #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Now Ryota Kawamata is talking about measuring galaxy sizes at z=7-8. They're small! What do the HST frontier fields say? #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Mao asks, where are the counter images? Barone-Nugent doesn't have time for lens finding, he's got a high z LF to measure! #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

...which is to say (Barone-Nugent says) that the mag bias corrections to the LF are robust to assumptions about the deflectors #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

One ought to fit for the deflectors as well as the sources, but Barone-Nugent thinks there is not much information on them... #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Barone-Nugent: in fact, mag bias contains information about the luminosity function: bias estimates agree with the LF from counts #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Barone-Nugent: the LF in current z=8 surveys are not significantly affected by mag bias, but future z=10 surveys will be #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Barone-Nugent does indeed see magnification bias: bright sources have higher mag than faint ones. Blank fields are lens fields! #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Barone-Nugent is modelling every pair of foreground and background z=7 detection in BORG as a lens, and inferring magnification #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Barone-Nugent: mag bias should mean that blank field surveys for LBGs should contain lensed objects, esp close to massive ETGs #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Rob Barone-Nugent is next up, telling us about high z lensed galaxy surveying. Bayesian treatment of magnification bias, oh yeah #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Markus Werner is interested in the *statistics* of hyperbolic umbilics, he told me at tea. That's good, Dahle has a new example! #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Nice! Coe congratulates our hosts on the excellent performance of Oguri's GLAFIC lens modeling code in the HST FF challenge #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Looks like typical magnification uncertainties are 25%, based on lens models that use most information and agree with each other #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe: magnification estimates for individual galaxies! most high z galaxies are magnified by less than 10, where errors are small #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe: the parameters we are most interested in (counts, volume, colors) are not so affected by lens model uncertainty anyway #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe predicts 70 z>9 gals in FFs if early gal evol is gentle, 10x fewer if it's extreme. Predictions from diff lens models agree #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe: at high z, lensing boosts discovery at the bright end: this argument led to the 6 cluster HST frontier fields #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe: "only a handful" of candidates at z > 9 - need more to understand galaxy evolution at these early times. #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Coe: fewer detected galaxies at z=10 than expected? Might imply dramatic evolution in the population in the first 500 Myr #IPMUlens

2

Phil Marshall @drphilmarshall · Nov 20

Dan Coe now talking about the hunt for the most distant galaxies. He's interested in z=8-11 galaxy morphology! And reionization. #IPMUlens

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Phil Marshall @drphilmarshall · Nov 20

Keeton asks about the error budget: Bradac says it is *not* dominated by magnification (ie cosmic telescope lens calibration) #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Bradac: GLASS goal is to probe the patchy vs smooth reionization from the stats of Lyman alpha emitters. Evidence hints at patchy #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Bradac: MOSFIRE follow up at Keck is still important for robust spectro id #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Treu and Bradac are trying to measure z=7-8 galaxies spectroscopically with HST grism survey "GLASS" (the L stands for "lenses") #IPMUlens

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samore @s_a_more · Nov 20

I would like to see two-d plots of Marusa's constraints from her SED fitting. #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Bradac sees the more numerous galaxies at the faint end of the LF, and her sample agrees with others' - so are old pops normal? #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

I guess we should think of Spitzer as a camera attached to a high mag cosmic telescope - forgot to mention SURFS UP uses lenses #IPMUlens

Phil Marshall @drphilmarshall · Nov 20

Bradac sees old stellar populations even at z=9.5, when the age of the universe is only 500 million years or so #IPMUlens

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Phil Marshall @drphilmarshall · Nov 20

It's amazing that Spitzer can detect galaxies at z=7. Check out Bradac's SURFS UP program, it's the little telescope that could #IPMUlens

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Phil Marshall @drphilmarshall · Nov 20

#IPMUlens Thursday! Bradac is telling us various tales about surfing the high z universe. "Lensing is Fantastic!" (TM)

Phil Marshall @drphilmarshall · Nov 19

Collett convinced me that both Jackpot SL and CFHTLens WL cos pars are accurate, because bias/uncertainty is small in each case #IPMUlens

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Phil Marshall @drphilmarshall · Nov 19

RT @SCTrager: As co-author on these papers, cool stuff, but still worry that stellar pop models pushed beyond reasonable limits #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

RT @AstroRJS: Comparison depends on IMF shape. If allowed to change M_low (why not?), can reconcile low M/L with spec. #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

.@brendonbrewer Coe just asked about the possibility of learning basis sets from simulations; one issue is the realism of sims #IPMUlens

View conversation

Phil Marshall @drphilmarshall · Nov 19

Sense is that FF modeling comparison shows that cluster lenses are now calibrated well enough that mag errors don't dominate #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Jauzac agrees: cluster modeling now limited by model bias, but also other systematics, including image identification #IPMUlens

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Phil Marshall @drphilmarshall · Nov 19

Discussion time at #IPMUlens! Meneghetti echoes Vegetti, saying that we are now limited by our modeling ability. Better algorithms/software!

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Phil Marshall @drphilmarshall · Nov 19

Maturi: PCA modeling gives very good fits with uncorrelated residuals, higher order unweighted moments can then be taken #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Maturi: weighted moments do not work for flexion measurement. Instead, he proposes an "optimal" basis set from PCA decomposition #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Maturi "thanks God we have other stars and not just our Sun, so we can measure the PSF" #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Finally, Matteo Maturi is at #IPMUlens, talking about flexion in clusters. It's the gradients of shear and convergence! Should be good, no?

Phil Marshall @drphilmarshall · Nov 19

Marioka's GRAMOR statistics look like arc statistics, but can be more sensitive to cosmology. J1149 is not ideal though, it seems #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

MT @novaric: Caterpillar is a typical case of merging pair attached to a single image: surface brightness and colors can differ #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Marioka: cross section for GRAMOR production is quite sensitive to cosmology. First one found in cluster MACSJ1149 in 2009 #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Masayo Marioka is working on "GRAMORS" - highly magnified but morphologically regular images #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Campusano: KS test to compare simple model arc distributions with observed one. Concentrations seem high, model needs extending #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Key to Campusano's work is an X-ray selected sample homogeneously imaged with VLT FORS1. Short exposures but that's ok! #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Campusano switches gears: he's after cluster density profiles from arc statistics #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

I am greedy: maybe the star formation rate in the arc is high enough to hope for a supernova during the long monitoring campaign? #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Dahle: system is similar to B1359, but with much larger image separation. Quasar host galaxy visible in HST images, looks clumpy #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Dahle: NOT monitoring since 2012, 50% variability should enable time delay between merging pair images. #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Dahle: LensTool model predicts 2 more images, 1 seen faint in correct position. Arc is naked cusp, time delays are 100s of days #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Dahle: PS theres an arc at z=2.3 #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Dahle: image separation is 15" (!), source redshift 2.82, with two faint central images confirmed spectroscopically. #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Yes! An exotic lens from Hakon, a 6-image lensed quasar SDSSJ2222+2745! Found in SGAS visual search (Gladders et al) #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Vegetti asks: why isn't anyone fixing to the pixels? Grillo's reply: too much information! Bradac: images offset... Vegetti: and? #**IPMUlens**

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Phil Marshall @drphilmarshall · Nov 19

In contrast to yesterday's galaxy substructure discussion, today's #**IPMUlens** cluster speakers are all about testing on simulations!

Phil Marshall @drphilmarshall · Nov 19

Lam doesn't use image brightness as model constraints, but his predicted image magnitudes are impressively self consistent #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Lam: the caterpillar is an outlier (4") in predicted image position, rms is sub arcsec. Released image morphological look good! #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Lam'a model is grid of Gaussians plus NFW halos for galaxies, some of them individually freed. Lots of model degeneracy to sample #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Lam: using Diego's WSLAP code. Points out problem of counter image of "caterpillar" in A2744, tension with Jauzac? #IPMUlens

samore @s_a_more · Nov 19

Perhaps Carrasco needs to consider correlated error bar on the concentration and mass estimates. Larger mass - lower concentration #IPMULens

Phil Marshall @drphilmarshall · Nov 19

Daniel Lam: free-form lens modeling of galaxy clusters, to try and get at high z source luminosity function #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Carrasco: rough consistency with predictions from Meneghetti's sims but it's noisy. Scatter increases when other samples overlaid #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Carrasco makes simple LensTool lens models, with prior on M200 from dynamics via Evrard et al 2008 formula #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Carrasco: spectroacopic observations of 29 RCS Giant Arcs sample clusters, to get velocity dispersions #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Next at #IPMUlens Mauricio Carrasco is working on lensing and dynamics in clusters, trying to get at the concentration mass relation

Phil Marshall @drphilmarshall · Nov 19

Grillo: simulated clusters under predict the number of subhalos, and also their masses. Tidal stripping in sims too fierce? #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Grillo: the two main DM halos in the model are offset from the two BCGs, possibly interesting for SIDM. #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Grillo and Suyu modeled MACSJ0416 with GLEE, with image positions as input data: they can predict them to 0.36" #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Grillo: CLASH-VLT is mapping out line of sight structures, and enabling dynamical mass estimates from caustics #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

OK, back to MACSJ0416 with Claudio Grillo. He's pointing out that substructure in clusters is a probe of WDM vs CDM vs SIDM #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Wong: low mass of z=1.62 lens implies no dark matter, or a Chabrier IMF. Stellar density is high, similar to Smith et al's lens #IPMUlens

Tom Collett @TomCollettAstro · Nov 19

Negative dark matter fraction is unphysical. K Wong at #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Wong's lensed source shows Lyman alpha at zs=2.26, the lens galaxy has stellar mass 2x10^11 Msun. Einstein radius is 0.38"! #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Back from lunch here at #IPMUlens, Ken Wong is talking about a galaxy scale lens in a cluster at z=1.62

Phil Marshall @drphilmarshall · Nov 19

Jullo degraded 2/3 of the multiple image spec-zs to photo-zs, and saw w_DE shift from -1 to -2. It's so good to break your toys! #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

I learnt more about cluster mass modelling accuracy in the last 20 minutes than I did in the previous ten years #IPMUlens

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Phil Marshall @drphilmarshall · Nov 19

Meneghetti: same code operated by different users leads to different reconstructions. We are part of our apparatus, people. #IPMUlens

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Phil Marshall @drphilmarshall · Nov 19

Meneghetti: magnification error varies systematically with azimuth relative to cluster major axis, but oppositely for Ares & Hera #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Meneghetti: CATS team (LensTool, Jauzac) indeed recover the Ares critical curve. Hera is harder for everyone #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Meneghetti: 8 teams submitted models blind. For Ares, parametric models recover profile to 2%; non parametrics have 10% scatter #IPMUlens

samore @s_a_more · Nov 19
Wonder if Massimo already provides the strong lensing image positions or asked the modellers to find them in his data to be evil #IPMUlens

Phil Marshall @drphilmarshall · Nov 19
Meneghetti: Hera is an N body DM simulated cluster, with galaxies painted on semi-analytically #IPMUlens

Phil Marshall @drphilmarshall · Nov 19
Meneghetti: Ares was made with Giocoli's MOKA code, so LensTool should do *really* well, except they included an isodensity twist #IPMUlens

Phil Marshall @drphilmarshall · Nov 19
Meneghetti's simulated HST images are incredible. 242 multiple images of 85 background UDF galaxies in the Ares cluster - wow #IPMUlens

2

Phil Marshall @drphilmarshall · Nov 19
Meneghetti: realistic massive clusters, SkyLens generated images and derived catalogs, redshifted etc, distributed blind #IPMUlens

Phil Marshall @drphilmarshall · Nov 19
Just in time, Meneghetti steps up to talk about the FF lens modeling comparison project, and the simulations involved #IPMUlens

Phil Marshall @drphilmarshall · Nov 19
Jauzac reports, the plan for coping with line of sight cosmography contamination is to search for structures, and model them... #IPMUlens

Phil Marshall @drphilmarshall · Nov 19

Jauzac showed a plot by Jullo where the cosmographic precision (in w or Om) improves by a factor of 6 with 10 times more images #**IPMUlens**

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Phil Marshall @drphilmarshall · Nov 19

Jauzac: FF lenses give the best handle on the faint end slope of the z=7-8 luminosity function #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac: very significant difference between magnifications pre and post FF data; sims to probe systematics are essential #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac's SL data for A2744 includes 159 multiple image constraints. Similar lenstool model precision to 0416 #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac: merger scenario for MACSJ0416 is pretty complex, but they see some significant X-ray - mass peak offsets #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac: MACSJ0416 LensTool model predicts image positions to rms of 0.68", measures mass to 1% precision, magnification to 4% #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac's MACSJ0416 analysis includes 194 multiple images, and 100 weakly lensed galaxies per sq arcmin! #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Jauzac is telling us about the HST Frontier Fields, and the highly constrained cluster mass models they enable #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

@AstroRJS I asked Barnabe if he would make the IMF vs IMF plot for his and Spiniello's XLENS sample; watch this space! #**IPMUlens**

View conversation

Phil Marshall @drphilmarshall · Nov 19

Combining with Spinello's spectral IMF normalization, Barnabe finds (last night) a low mass IMF cutoff of 0.1 Msun #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe sees some scatter, but Salpeter seems reasonable for all XLENS galaxies, 250 to 400 km/s. #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Regarding the IMF, Barnabe measures gravitating stellar mass to better than 0.1 dex! Enables detailed comparisons with SPS models #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe also finds that early type galxy halos are slightly rounder than their galaxies, but it's marginal #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

In the XLENS sample, Barnabe sees a strong anti correlation between DM fraction and stellar mass density #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe's kinematic data come from X-Shooter: "poor man's IFU", but enough to reconstruct dark matter fraction profile **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe applied axisymmetric gen NFW DM halo plus multi Gaussian expansion for stellar mass to the XLENS sample (from SLACS) **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe: CAULDRON code enables self consistent lensing and resolved dynamics analysis (anisotropic Jeans models) **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe: dynamics of z=0 massive galaxies have been studied "in painful detail" - lenses help meet the need for earlier galaxies **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Barnabe is next up: detailed gravitational structure of massive (lens) elliptical. "Simplicity almost certainly deceitful" **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Treu: papers by Dutton and Shankar each use holistic, empirical population models to investigate mean DM profile, and find NFW **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Koopmans, looking to the future, is excited about larger samples but foresees a need to re-focus on unique applications... TBC! **#IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Koopmans: heavier IMFs seen in more massvie lens galaxies, so dark matter fraction within half an effective radius is ~constant #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Koopmans: separating stellar and dark mass means interpreting colors with stellar population synthesis models: opens up IMF study #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

Koopmans: many different strong lensing analyses demonstrate and quantify dark matter in galaxies, with and without dynamics #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 19

It's galaxies and clusters day at #**IPMUlens**! Koopmans is getting things started, talking about dark matter in galaxies

Phil Marshall @drphilmarshall · Nov 18

@s_a_more The difference between pixelated and simply-parametrized source models? Seems to be the main difference in approach #**IPMUlens**

View conversation

Phil Marshall @drphilmarshall · Nov 18

Some skepticism that simulations prove accuracy, or that the time to simulate data is worth the cost.. Astronomers vs physicists? #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Fascinating discussion about the necessity (?) of making realistic mock lenses to test accurate substructure measurement #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Rusu: SDSSJ1405+0959 seems to have 2 lens galaxies, 3 quasar images and a host (or companion) galaxy separated from the quasar #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rusu's image positions are ~10x more precise than those from Magellan, and his host galaxy model luminosities sit in the relation #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rusu: PSF stars not good enough for precision modeling; instead, fit for double Gaussian PSF model too #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rusu: Subaru LGSAO observations need a tip tilt star with mag < 18 st separation < 90": he did 25 lenses in 3 nights, ~10% strehl #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rusu is the closer: AO observations of SDSS lensed quasars with Subaru IRCS #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Tsupko: propose to study plasma in lens galaxies this way. Refraction is larger effect, need density profile. And then good data #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Tsupko: in inhomogeneous medium need to consider refraction as well. Radio images expected to form ~1 mas from optical images #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Tsupko: images will appear dispersed into prism spectra, like rainbow. Effect is only relevant at radio wavelengths #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Tsupko: is gravitational deflection in homogeneous medium same as in vacuum? Answer is no if medium is dispersive, like in plasma #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Tsupko! Gravitational lensing in the presence of plasma. Punchline: it's not achromatic #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Nierenberg speculated about surface brightness limitations, I wondered about selection effects (but Treu is not too worried) #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Yonehara: size must be much smaller than the unlensed size-luminosity relation. A puzzle! #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Yonehara has good VLT SINFONI data: assuming a circular Gaussian source and power law lens, puts limits on size and slope #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

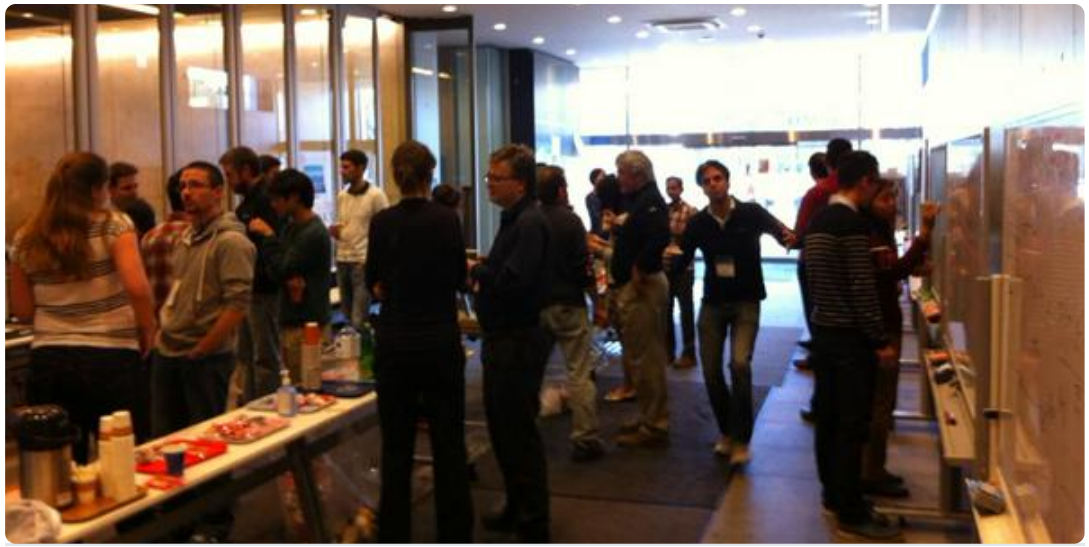
Yonehara wants to measure NLR sizes at high z, high L, using magnifying lenses. Problem is degeneracy with lens density profile #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Yonehara is also looking at the narrow line region, and pondering its luminosity size relation, by seyfert type, and redshift #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

#IPMUlens tea break! Look at all these lovely people



Expand

Phil Marshall @drphilmarshall · Nov 18

Wuyts: SGASJ1110 shows "string of pearls" giant arc with many small (100pc) star forming regions (Johnson et al) #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Wuyts: SDSS giant arc survey found (after follow up) 170 new lenses; now being imaged with HST and modeled #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Wuyts: "yesterday we heard that we should move away from visual identification of lenses, and after doing 40,000, I agree" #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Wuyts has beautiful OSIRIS data that shows clumpy star formation and a merger velocity field, including a tidal tail #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Wuyts: RCS0327 has an arc so bright it's visible in the DSS photographic plates. "I'll just give you a few moments to love that" #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Wuyts is focusing on star formation at z=2-3, "cosmic noon." Lens magnification enables resolution of HII regions ~100 pc in size #IPMUlens

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Phil Marshall @drphilmarshall · Nov 18

Eva Wuyts is looking at star forming galaxies through cosmic telescopes that other people have set up and calibrated. Good! #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh points out that the SPT and Herschel lenses have slightly different selection: SPT lenses are dustier, w/no optical light #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rybak: substructure potential corrections are being implemented, but required grids for VLBI are huge! #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Rybak: effect is strongest in SPT0346, where the extended array resolves out a lot of flux. Looks like quite a compact source! #IPMUlens

samore @s_a_more · Nov 18
I wonder why Rybak's einstein radii error estimates are always 5-10 times larger than Yashar's. #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Rybak's lens models are consistent between the two array configurations/resolutions but the source structure changes #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Rybak is testing against Hezaveh's 2013 ALMA data and results, but using a pixelated source regularized in the image plane #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Rybak is reminding us of the sparse sampling of radio interferometric data. I love how *work* has to be done to make an image #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Matus Rybak is modeling radio lensing data in the uv plane, like Hezaveh - motivation is the high resolution of global VLBI #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Nierenberg: narrow line observations are enlarging the sample of substructure lenses by a factor of 2-3 #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Nierenberg: mass clump is ~10^7.5 Msun. But is 1 lens plane clump a good model? Need more data. OSIRIS upgrade (x2strehl) coming #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Nierenberg: subhalo position and mass can be jointly constrained in B1422 by the narrow line image # fluxes and positions #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Nierenberg: narrow line flux ratios only possible with spatially resolved spectroscopy. She's using Keck OSIRIS #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Nierenberg points out the value of studying many different source types/sizes, to get complementary information on the subhalos #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Back from lunch, Nierenberg is about to show us her narrow line region millilensing results #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Takahashi: future work to include multi-plane lensing and sims with baryons #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Takahashi's prior predictive magnification anomaly PDFs easily contain the observed values, hence the all-understood conclusion #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

... And then ray trace through n-body sims (with Born approx) to predict convergence and shear distributions for each (Takahashi) #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Takahashi is now elaborating: they use mid IR data for the fluxes, and CASTLES HST image positions, for 6 quads... #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Inoue claims line of sight subhalos can account for all the flux ratio anomaly signal, and predicts signal will increase with zs #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Inoue: magnification perturbations also need nonlinear clustering - semi analytic halo model calculations predict 10-20% effects #**IPMUlens**

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Phil Marshall @drphilmarshall · Nov 18

Inoue: astrometric perturbations are induced by structures on wide range of scales, clusters to subhalos #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Inoue: how does non-linear clustering affect predictions? In k space, weak and strong lens regimes separated at klens ~1/4thetaE #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Inoue now talking about line of sight structures - clumps, voids etc - as sources of flux ratio anomalies #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 18

Vegetti and Wardlow suggest Morningstar and I add Evilness to the source, and to the beam, to try and break Hezaveh's inference #**IPMUlens**

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Phil Marshall @drphilmarshall · Nov 18

Hezaveh forecasts: 10 hour ALMA integration enables measurement of normalization of P(k), 40 hrs gets the break too #IPMUlens

samore @s_a_more · Nov 18

Is it important to also consider the low mass halos in the line-of-sight while detecting substructures below detection limits? #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh: undetected subclumps behave like a Gaussian random field: power spectrum should be inferrable from the image residuals #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh: smaller sources are better for gravitational imaging. Joint analysis of frequency-resolved molecular clouds enables this #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Or as Hezaveh puts it, "The Future is Here" #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh: ALMA is now in its highest resolution configuration, reaching PSF widths of 20-30 milliarcsec. Great for strong lenses! #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh describes the ALMA ring images and HST lens galaxy images as "conveniently mutually exclusive" #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Hezaveh now telling us about measuring the DM power spectrum on sub-galactic scales, from Einstein ring fluctuation correlations #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti emphasizes the need to look at pixelated potential perturbations to interpret the data... #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti: to distinguish warm and cold DM, we need to push down in mass to 10^8 Msun (25km/a). Options: AO imaging (SHARP), radio #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti: 1 detection (SDSSJ0946) and 10 non detections is consistent with CDM; no sensitivity to line of sight vs lens plane yet #IPMUlens

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samore @s_a_more · Nov 18
Are Simona's measurements of substructure fractions to the number density profile of subhalos and segregation by mass? #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti: the error in subclump mass due to its density profile assumption is lower than the deprojection (unknown z) error #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti is working with a representative subset of (high S/N) SLACS lenses, doing subclump detection by Bayesian model comparison #IPMUlens

Phil Marshall @drphilmarshall · Nov 18
Vegetti: gravitational imaging (Einstein ring brightness perturbations) picks up multiple substructures -> subhalo mass function #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Discussion. Treu: is the CLASS sample odd, somehow? Koopmans: radio propagation effects? Hezaveh: weird density profiles? #IPMUlens

samore @s_a_more · Nov 18

CLASS sample of gravitational lenses too anomalous, or propagation effects within the galaxy affect the radio observations (!?) #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Mao: however, the Rcusp values are unexpectedly high compared to his model: the fluxes seem to be too anomalous for CDM #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Mao: account for selection effects etc by injecting substructure into real radio lenses. He finds M<10^5 subhalos can be ignored #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Mao's program is to predict Pr(Rcusp) and compare with Pr(Rcusp|data): he sees some interesting outliers, but model is incomplete #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Mao has to separate macro model from subhalos, so includes higher order shape parameters, and constrains them with SDSS images #IPMUlens

Phil Marshall @drphilmarshall · Nov 18

Shude Mao gets us started on substructure day at #IPMUlens: "I've been working in this field for 15 years and I'm still confused"

Astronomy Meetings @astromeetings · Nov 17

This week:
#wfirs2014 (wide-field infrared surveys),
#IPMUlens (strong lensing),
#dsu2014 (dark side of the universe)
Anything else?

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Phil Marshall @drphilmarshall · Nov 17

Komatsu closes the discussion: he's convinced, strong lens cosmography is ON. #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Fassnacht: it's the PDF peaks, not widths that matter; stage 4 dark energy science is all about accuracy, not precision #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Discussion time at #IPMUlens. Treu's reminding us of context, now and in the 2020s. Nothing is cheap, corroboration between probes vital

Phil Marshall @drphilmarshall · Nov 17

Tests to be done with compound lenses: mass sheet robustness; first source mass model; including dynamics #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Collett: only a dozen of those 100 compound lenses really contribute to the dark energy measurement: so it could be cheap #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Still, Collett expects at least hundreds of galaxy scale compound lenses from Euclid: DE FoM of 40 or so, competitive at stage 4 #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Collett's forecasts show future samples dominated by systems with similar source redshifts; 0946 happens to be particularly good #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Collett: in the wCDM model, the Jackpot provides higher precision on w than all the CFHTLens weak lensing results. Precision. #IPMUlens

Russell Smith @AstroRJS · Nov 17

Catching up on first day of #IPMUlens through all the tweets from @drphilmarshall — thanks!

Phil Marshall @drphilmarshall · Nov 17

Collett: in SDSSJ0946 (the Jackpot) the isothermal approximation for the second lens/first source *may* not be good enough #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Collett's talk is reminding me that I am still not yet winning the argument that these objects should be called "compound lenses" #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Collett: new observable from compound lenses is the ratio of Einstein radii. Easy systems are rare: cross section goes as M^4 #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Last talk of the day: Tom Collett on cosmography with double source plane lenses #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Jee: systematics are potentially lower, though, as mass sheet degeneracy is broken. Velocity anisotropy is main source of error #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Jee: RXJ1131 measurements imply a precision for its angular diameter distance of 14%, cf 6% for time delay distance #IPMUlens

Astronomy Meetings @astromeetings · Nov 17

This week: “Galaxies and Cosmology in Light of Strong Lensing” #IPMUlens at @KavliIPMU

Phil Marshall @drphilmarshall · Nov 17

Inh Jee now discussing lens angular diameter distance measurement, via physical size from lensing (mass) plus dynamics (potential) #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Suyu: new COSMOGRAIL delays for HE 0435 improve H0 precision by a factor of two. Analysis is still blinded for now though! #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Suyu et al are applying Chen's flexible PSF modeling technique to the HST data for HE0435 - some underfitting at AGN positions? #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Suyu: H0LiCOW goal is to measure H0 to better than 4%, from a sample of 5 lenses, and explore new systematics #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Both Rathna Kumar and Aghamousa are getting significant value from the TDC1 data post-challenge, which is cool #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Fassnacht and I would like to see 1000 mock lenses analyzed in the same way, blind. We're not there yet but we've got a few years #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Rathna Kumar et al infer H0 to 8% from 11 lenses, with no high resolution follow up #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Rathna Kumar aims to measure H0 from an ensemble of lenses using the PixeLens modeling code, independent of H0LiCOW. Bring it! #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

I asked if it could be millilensing - Vegetti says "not by blobs!" but agrees that a more complex mass model could be the answer #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Chen: reconstruction from real RXJ1131 AO data shows interesting residuals. Koopmans asks about chromatic effects, I'm not sure #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Chen is showing some outrageously high quality results from his blind test, recovering both lensed source and fine structured PSF #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Chen and Suyu are experimenting with simultaneous (iterative) PSF and lensed image modeling. Both models are grid based! #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Chih-Fan Chen asks: Can AO provide as good images for time delay lens cosmography as HST? The problem is not knowing the PSF... #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Aghamousa's inferred vs true time delay plot is awesome. Fassnacht notes sotto voce that he hopes the photo-z people are watching #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Aghamousa and Shafieloo focused on keeping the success fraction high. Good! We need more time delay lenses #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Aghamousa explaining their entry to the Time Delay Challenge: they use internal consistency in quads to estimate uncertainties #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Hilbert's using the recursive-TCM interpretation of N-body sims, it seems to give a more faithful representation of CDM lens halos #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Hilbert is also working on highly realistic (ie with non-simple lenses) high res mock images. We need this! #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Hilbert is tasked with providing alt cosmology simulations for testing lens cosmography, perhaps with Angulo's rescaling trick #IPMUlens

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Phil Marshall @drphilmarshall · Nov 17

Keeton and Wong are modeling lines of sight containing multiple clusters. Meanwhile Vegetti worries about small dark perturbers #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Keeton is not worried about the mass sheet degeneracy, arguing that including any external information, Pangloss style, breaks it #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Keeton: background perturbers can be treated as lens plane shear, foreground deflectors need to be included in the lens model #IPMUlens

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Phil Marshall @drphilmarshall · Nov 17

Keeton: in this tidal approxn, ext shear and convergence appear in linear deflections. We have a nonlinear tensor lens equation #IPMUlens

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Phil Marshall @drphilmarshall · Nov 17

Keeton: treat line of sight deflectors as quadratic potentials, with constant shear and convergence contributions #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Keeton thanks anyone who slogged through all 100 equations in McCully et al 2014. (shuffles feet) #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Keeton is now breaking his and McCully's multi plane lens theory to us, gently. Still, I sense some trepidation in the room #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

Fassnacht: halo model approach of Collett, Marshall et al doesn't use clustering or weak lensing, but it should. I agree! #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

Fasanacht: galaxy overdensity as a proxy for kappa_ext is the simplest possible approach, Koopmans describes it as "robust" #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

Fassnacht on B1608, wonders out loud what it says about him that he "fell in love with such a complex thing" #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

Fassnacht: the external convergence problem is close to his heart, as "B1608 is [his] favorite lens in the universe" #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

At coffee, Courbin suggested to me that Bayesians are more likely to fail at blind challenges, due to over-confidence #**IPMUlens** @davidwhogg

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Phil Marshall @drphilmarshall · Nov 17

Courbin is taking nightly VLT observations of HE0434, data's impressive. 0.4" seeing is a problem, as reference PSF stars saturate #**IPMUlens**

Phil Marshall @drphilmarshall · Nov 17

Courbin: millimag variations on few day timescales (tracked with large telescopes) may provide sub-percent accuracy time delays #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Courbin: multiple monitoring seasons are needed, because AGN variability and microlensing timescales are similar. 5 yrs minimum? #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Courbin now reminding us how COSMOGRAIL achieves high precision lightcurves by stably deconvolving images from 1m-class telescopes #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Treu & Meng: cosmology-grade follow-up of each LSST time delay lens will take 15 mins with TMT. 5 nights per year for 10 years? #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Treu: where will the high resolution follow up come from? Lens modelling H0 errors: LSST,Euclid >10%, WFIRST 5%, TMT < few % #IPMUlens

Phil Marshall @drphilmarshall · Nov 17

Treu, humbly, on attempting cosmography with 1000 lenses: "everyone's got a plan until they get punched in the face" (M. Tyson) #IPMUlens

2 4

Phil Marshall @drphilmarshall · Nov 17

Treu gets the Kavli #IPMUlens meeting going with some future predictions, despite the warnings of Yogi Berra

Expand

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