

*Santa Monica Amateur
Astronomy Club*



May, 2017

The Observer

Upcoming club meeting:
Friday, May 12, 7:00 pm

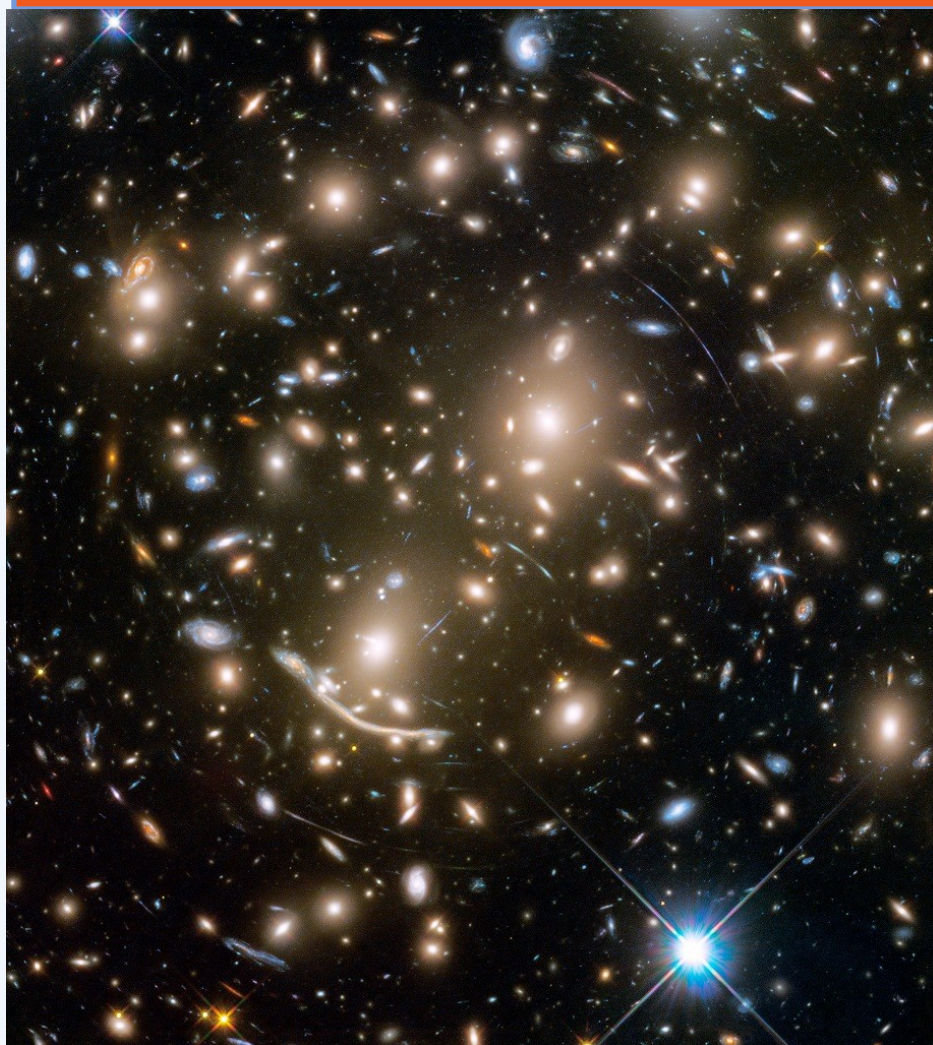
Topic: “A Universe of Galaxies”

Speaker: Tim Thompson

Tim will give us an “encore talk” on the universe of galaxies beyond our home in the Milky Way!



Credit: Hubble, Subaru; Composition & Copyright: R. Gendler



INSIDE THIS ISSUE

New results from galaxy simulations!

Upcoming events

OUR MEETING SITE

Wildwood School
11811 Olympic Blvd.
Los Angeles, CA 90064

Free parking:
Garage, SE corner of
Mississippi &
Westgate.

IMAGE AT LEFT:
Galaxy cluster Abell
370. Light from even
more distant sources is
bent by the mass of this
cluster, and ‘lensed’ into
strange, distorted
shapes.

Longstanding Galaxy Mystery Resolved?



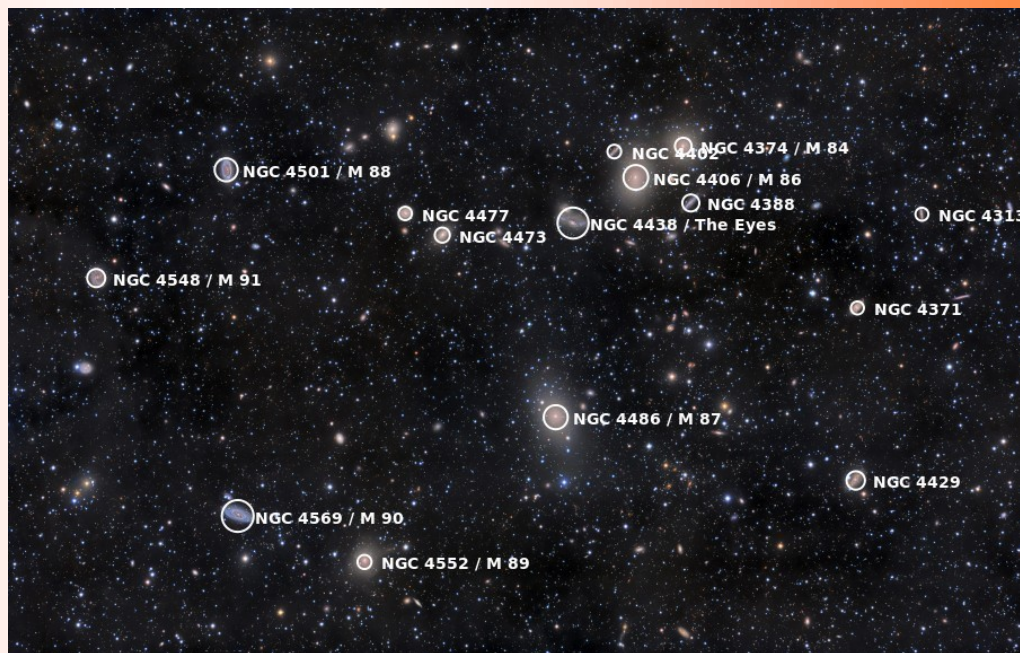
Has a long-standing galaxy mystery finally been resolved? Computer simulations of galaxy formation have, for years, suggested to astronomers that there should be hundreds of dwarf galaxies for every large galaxy we see—such as our own Milky Way. Astronomers have searched in vain for these numerous dwarfs. Could they, being made of large quantities of dark matter, simply be too elusive for our optical and radio telescopes? Did they get eaten up over time by the larger galaxies? Where could the answer lie?....

Crunching the numbers...



Remember the scene in “The Martian” where someone dashes off and casually hooks up a laptop to the supercomputer bank? Apparently, that doesn’t happen! It takes a special clearance procedure, and some doing, to become a ‘guest’ on a supercomputer like this!

As it turns out, the answer may lie not with dark matter, galaxies or telescopes. New simulations on giant super-computers, such as the “Pleiades Supercomputer”, can run trillions of test-masses through the simulation, providing a modeling power unheard of until recently. These better models suggest that supernova explosions and other stellar conflagrations may ‘stir up’ the gas from which galaxies form, suppressing the formation of dwarf, satellite galaxies. Perhaps the Virgo Cluster (below), visible through a modest-sized telescope, has just the right number of galaxies after all.



So, where did our club members hear all about this? (Next page!)

Club Members Journey to the Eta Carina Nebula (at Caltech)



At least eight of our club members ventured to Caltech, to hear a short talk on galaxy simulations, view the moon and attend a panel discussion afterward. Robert, Mimi, Vicky and some of our younger astronomers (with a mix of playfulness and scientific curiosity!) were among the attendees.

There will be another event in this series in June:

“THE ORIGIN OF THE ELEMENTS”

Ivanna Escala

June 2, 8 pm

Cahill Center for Astronomy and Astrophysics, Caltech

That will be the last one for this academic year, but the series may continue next year!

Go to:

<http://outreach.astro.caltech.edu>



Dark Matter...matters

Simulations of galaxy formation also show that dark matter—or something that stands in for it—is absolutely critical to the process. Amazing! This mysterious, unseen and once-unsuspected mass turns out to be the ‘glue’ that allows our universe to take the form we see today. Without the invisible components of our universe, we ourselves would not have a place in space—nor a world on which to evolve.

Round and Round and Round We Go



Simulations also show that spiral arms are not permanent, but come and go over time.



Mysteries remain: Did black holes seed galaxies? How do we make these supermassive black holes if intermediate-mass black holes, still unconfirmed, don't form first?



Of course, all models must ultimately be checked against reality. Yet, we now see simulations that produce remarkably close analogs to what we see in nature.



Parting Shot:

Caltech astronomer Andrew Wetzel answers questions from our group.



Left: The Real Deal! An actual interacting galaxy pair, Arp 273. These galaxies lie 300 million light years away, in the constellation of Andromeda. Simulations can now do a good job of reproducing their basic features—but there is still nothing like the celestial beauty of an actual galaxy, floating with deceptive stillness in the vast reaches of distant space.

Image Credit: NASA, ESA, Hubble, ILL, Processing & Copyright, Domingo Peñalosa