Seminario 1
Astronomía y Astrofísica
(AstroLunch)

Dónde y cómo

- Todos los viernes 1PM
- Salón IP 101
- 1/3 noticias, 1/3 presentación fundamentos, 1/3 presentación proyectos.

Astro<u>LUNCH</u>

- La idea es almorzar juntos.
- Intentar traer algo para compartir.
- Presentaciones que no duerman a la gente.

Proyectos

- 3 noches (miércoles) ayudando en el Observatorio.
- Algún proyecto propuesto por un profesor (la lista viene la semana que viene.)
- Algún proyecto propuesto por ustedes mismos.

Journal Club

- 1 paper del arXiv.
- 1 paper del arXiv de astrobites.com

¿Ustedes quiénes son?

Brasil

LARIM

Latin
American
Regional
IAU
Meeting


OCEANIA CONVENTION CENTER


SAÍDA

267

SUPER-MASSIVE BLACK HOLE GROWTH IN THE FIRST GIGAYEAR OF COSMIC HISTORY

Theoretical Framework

The physical processes that we follow in our model are dynamical friction by dark matter and the velocity dependent accretion as the BH moves inside the halo. The major parameters in our model are thus the BH kick velocity, the initial BH mass and the dark matter halo host mass.

On our model we make the following major approximations:

(1) the dark matter halo follows an NFW profile wiath spherical symmetry. This means that the black hole will move in the radial direction.

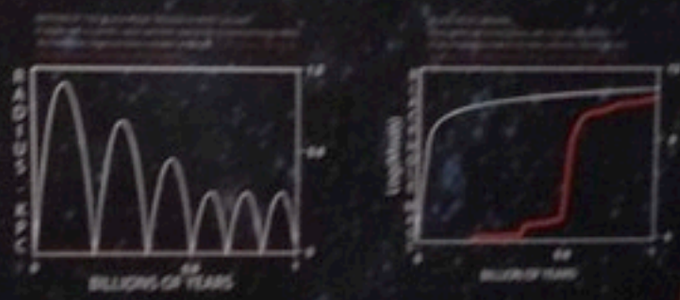
(2) the dark matter halo does not grow in time. In addition we also neglect the density of stars and the dynamical friction produced by the gas.

Figure C$_0$

Motivation

Observations have confirmed the existence of black holes (BH) with 10^9 solar masses at redshift $Z > 6$ when the Universe was 1Gyr old.

These observations impose constraints on the astrophysical processes responsible for the BH growth. The main purpose of our work is following BH growth after receiving a velocity kick following a merger. During it's motion across its host galaxy the BH will accrete gas while dynamic friction by dark matter drives the BH to the center of its host galaxy. We present the first step in this research program by assessing the impact of the kick on the BH growth compared to a static situation.



RESULTS

1. THE FASTER THE BH IS MOVING, THE SMALLER THE ACCRETION RATE WILL BE.
2. THE BLACK HOLES MASS, THE GAS AND DARK MATTER DENSITIES ARE VARIABLES THAT PROPORTIONALLY AFFECT THE ACCRETION.
3. A STATIC BLACK HOLE ACCRETES UP TO [illegible] MORE MASS THAN A MOVING ONE WITH THE CONDITIONS SHOWN IN THE FIGURE C$_0$.

Universidad de los Andes

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A NETWORK BY STUDENTS, FOR STUDENTS

RECA

Red Estudiantes Colombianos Astronomia

OBJECTIVES

SHORT-TERM

- To create extracurricular opportunities for students where astronomy and astrophysics topics can be released and discussed.
- To establish a platform of student support that helps finding study offers such as summer schools, jobs, university scholarships around the world.
- To spread and extend all the activities, meetings and initiatives to all of Colombian cities.
- To offer initiative and creativity environments so that ideas and projects from students can be created and supported.

LONG-TERM

- Create opportunities for students where astronomy and astrophysics topics can be discussed.
- To crystallize RECA as a well-known reliable network for the scientific community of Colombia.
- To extend the initiative of RECA to the Latin-American countries so we can create the a worldwide astronomy network, make contributions and find opportunities as students.
- To be pioneers in the foundation of the first world society of astronomy and astrophysics students.

HISTORY

RECA is born because of the need of students interested in astronomy to generate spaces of interaction where all of the topics of this area could be presented, questioned and discussed.

In November the 8th of 2012, during the III COCOA (Astronomy Colombian Congress) the network was created with members of different universities from around Colombia.

14 Conferences about astronomy, both outreach and research presentations.
The guest speakers were Colombian physicists, geoscientists, astronomers who volunteered to show their work to students. All of the talks were broadcasted online and are available for the public in RECA's website.

Several academic resources regarding to study opportunities and job offers around the world.
RECA eases the student the need to search in different places for opportunities. There is a compendium of all of summer schools, university scholarships, and jobs available in the website and updated also in the social networks to let the student know all the possibilities to apply and extend their knowledge in Colombia or the whole world.

Constant presence in the most popular social networks that offers a better reach than a website because is inside the tools most students use everyday.
Another advantage is the instant posting information, everything announced reaches the public just after it has happened. It allows efficiency when giving news and a high chance of being read but most of the members.

WHO IS PART OF RECA?

FOUNDERS

JUAN DAVID

MARIA CAMILA 18

ANDRES FELIPE 22

PAULINA 19

SEBASTIAN 22

graduate or undergraduate program even in high school, that is interested in Astronomy and ...rt of RECA, there is no need for he or she to be studying this careers or one related. The following ...ows how RECA is conformed

UNIVERSITIES AND INSTITUTIONS THAT SUPPORT

Universidad de los Andes

WHAT HAS BEEN DONE?

ACHIEVEMENTS

Colombian students database that contains basic information, areas of study and interests regarding to astronomy in the several activities and through the social media, a survey for students has been spread.
In this, they were asked to express their interests in all the different approaches that an astronomer can work on. Besides, there was a chance to collect data ... the expectations of careers in astronomy and ... to the passion the person has for it. This al... record of the possible future Colombian ... a way of keeping track of them.

I RECA DAY

On October the 9th, the I RECA Day was made in the Planetarium of Bogotá. It was a whole day full of different activities regarding to astronomy that intended to fulfill the objective of creative common spaces to gather and discuss astronomy topics.
In the activities developed this day ... conferences of students and important Col... professors, exhibition of astronomy photographs ... in the space museum guided by profess... astronomers, late-night sky observation. Besides, ... logo of RECA was selected by the own members ... It was a chance for the people in Bogotá to ... enjoy a common passion.

...idactic module
...ities, some development in the explana-
...mena was observed, indicating a greater
...ive differentiation of concepts. For exam-

...in the percentage of responses indicating
... the shadows varies throughout the day
...6%) and during the year (from 6.1% to
...g on the position of the Sun;
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...s devices that permit the reading of the
...s of the behavior of the shadows (from

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...quisição e retenção de ...
...cognitiva. Lisboa: Plátano...
MORA, I. M. Uma investi...
...stronomia de professor...
...M. D. (Org.). **Ed...**

The effect of gas bulk rotation on the Lyman-alpha line

J. Nicolas Garavito-Camargo[1], J.E. Forero-Romero[1] and Mark Dijkstra[2]
[1] Universidad de los Andes, Bogotá, Colombia.
[2] Max Planck Institute for Astrophysics, Garching, Germany

What is the Ly-α line?

What information does the Ly-α provide?

1. Hydrogen is the most abundant element in the universe.

2. Give us information of the high redshift Universe

- Galaxy formation.
- Reionization
- Large-scale structure

Some models:

Results:

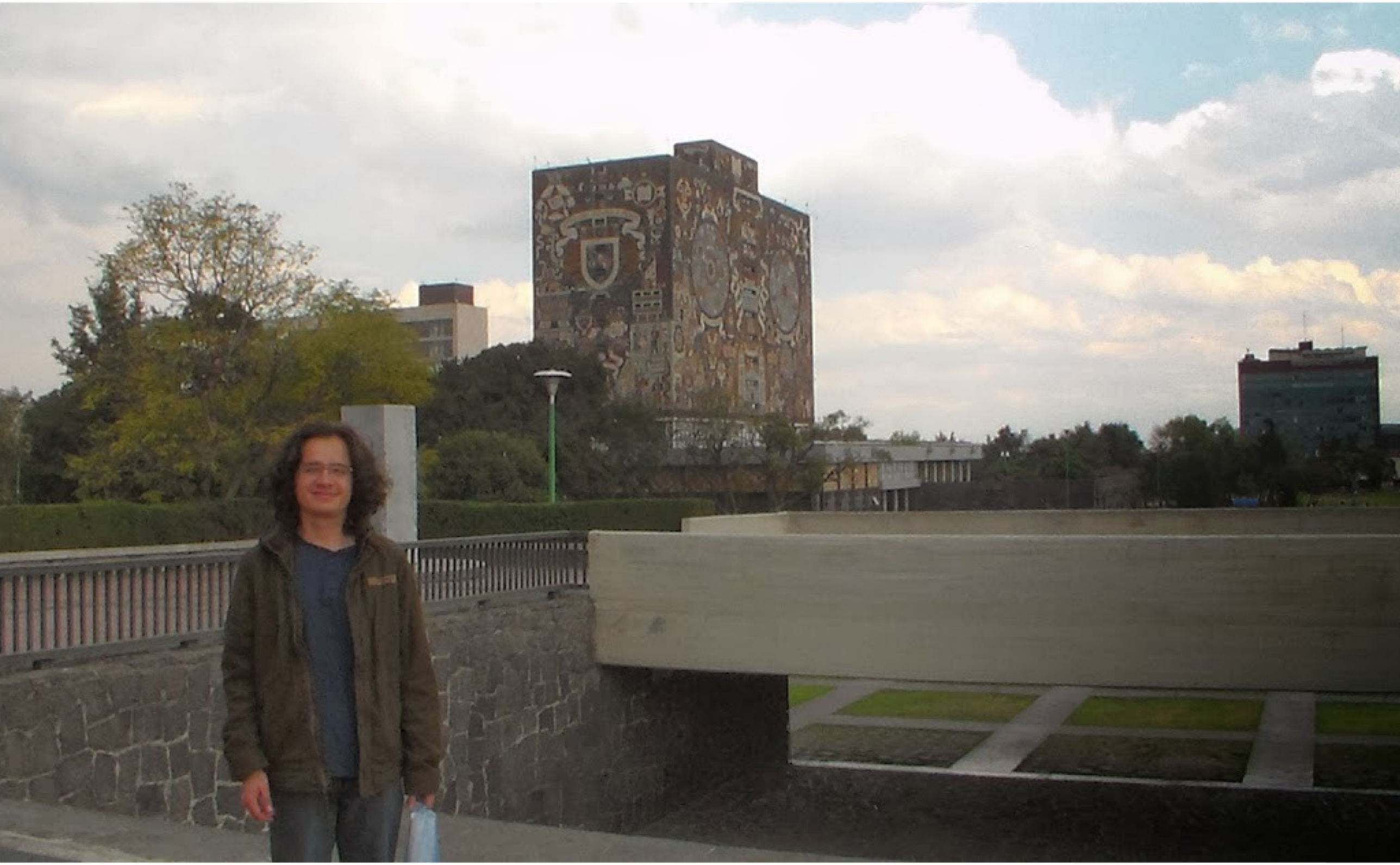
Conclusions:

References:


Increase of Ionization Fraction of Dusty Proto-Stellar Accretion Disks by Damping of Alfven Waves
Abstract
Introduction
MRI
Dust-Cyclotron Damping

México


RUBEN DARIO 281



Corea del Sur

KOREA INSTITUTE FOR ADVANCED STUDY

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1 2

JongHae Keum (School of Mathematics)

JongHae Keum is working on Algebraic Geometry, with particular interest in the algebraic surfaces. He has computed automorphism groups of K3 surfaces, extended to the positive characteristic Mukai's classification of finite automorphism groups of complex K3 surfaces, and constructed new surfaces of general type. He is also investigating, with much progress, the algebraic

GO

SEMINAR

MORE

January 28 (Tue), 2014
Physics
16:00-18:00 (1423)
Group Meeting
Jong Soo Lim (KIAS)

January 29 (Wed), 2014
Mathematics
11:00-13:00 (1424)
The contact triad connection on contact manifolds
Rui Wang (IBS Center for Geometry and Physics)

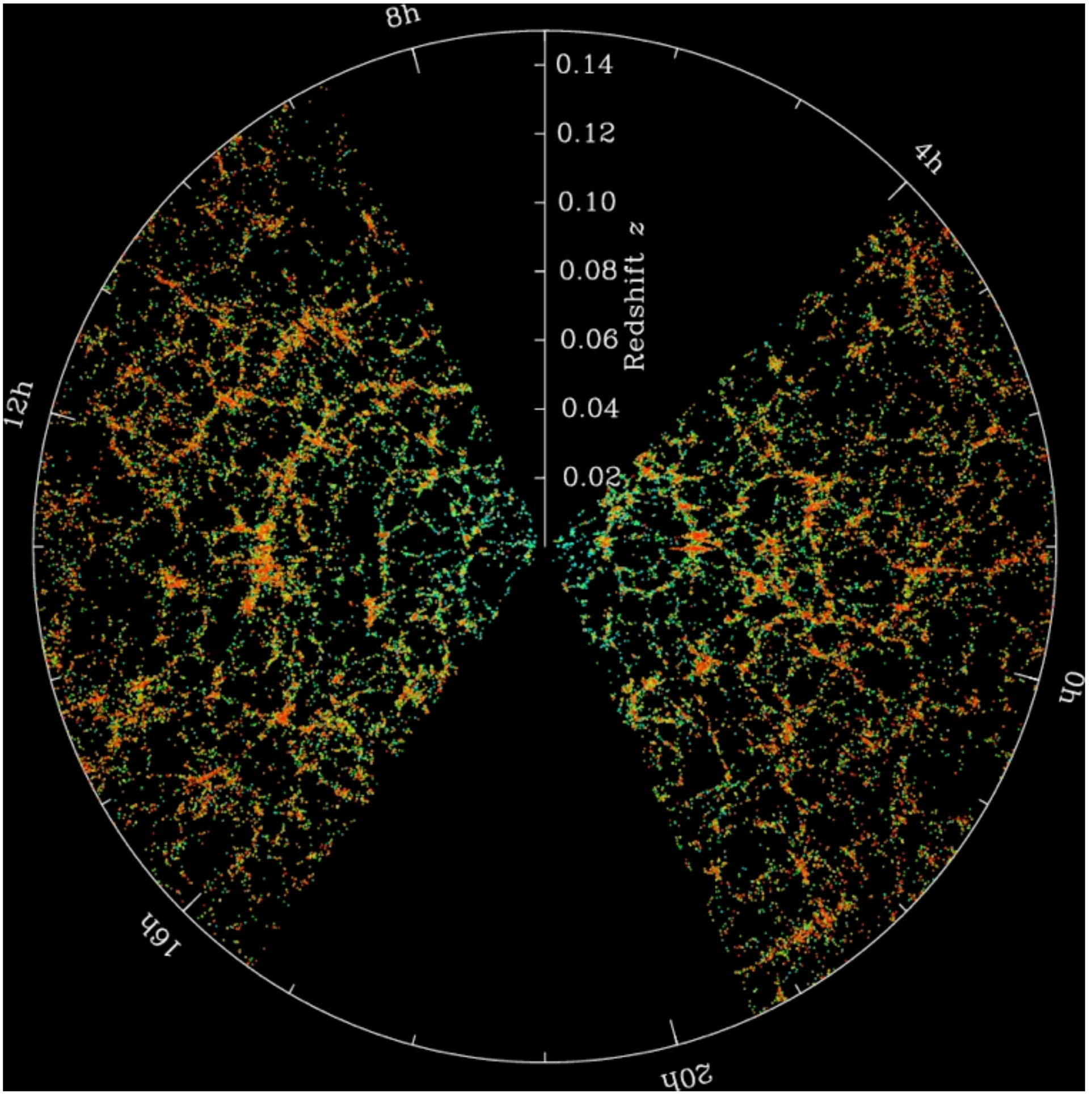
January 29 (Wed), 2014
Physics
12:30-14:00 (1423)
Astro-Lunch

CONFERENCE

MORE

February 09 (Sun), 2014 ~ February 15 (Sat), 2014
KIAS-NCTS Joint workshop on Particle Physics, String theory and Cosmology

February 10 (Mon), 2014 ~ February 12 (Wed), 2014


8h
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Redshift z

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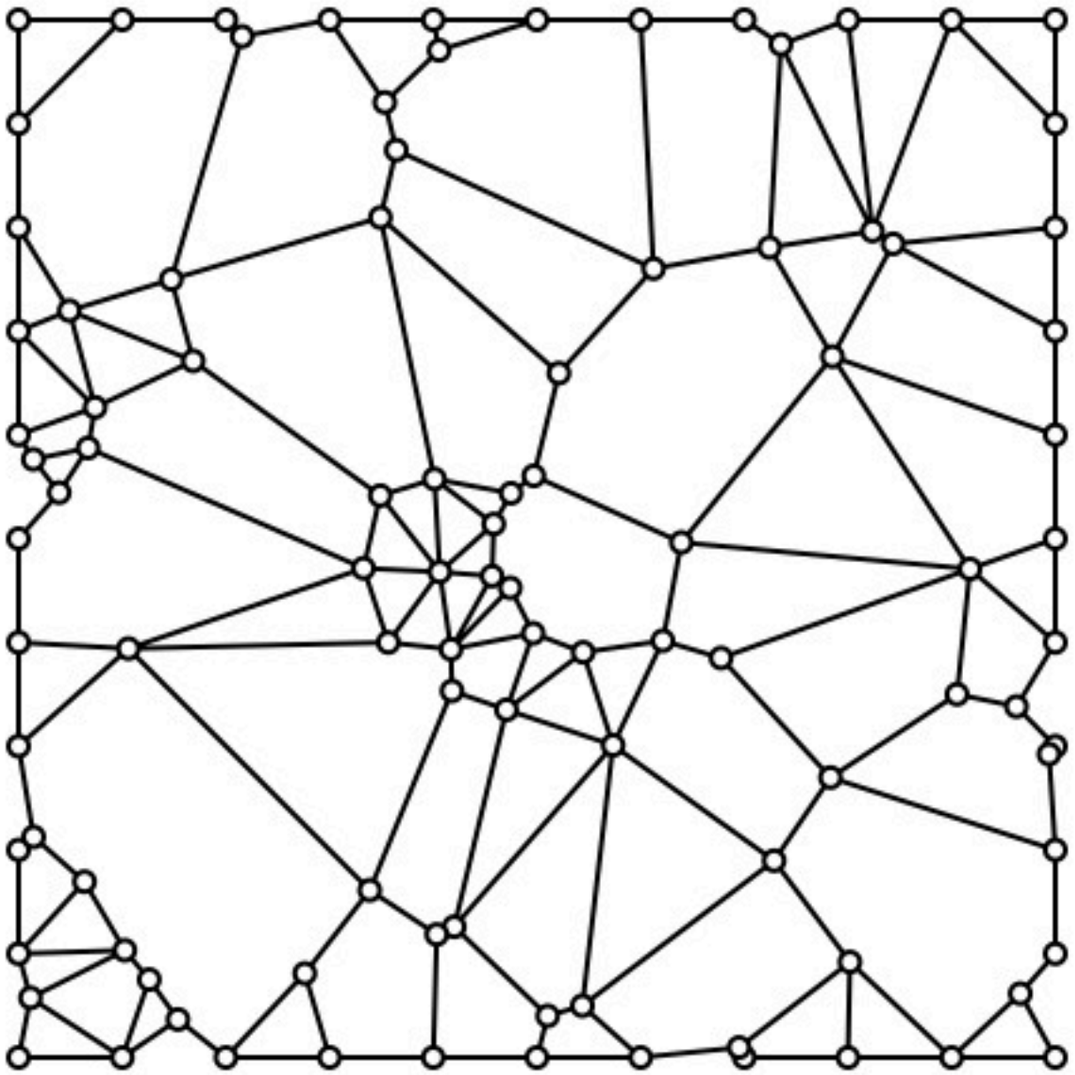


The Beta Skeleton

This demo computes the beta skeleton of a random set of 2D points. Use the buttons below to create new point sets, and the sliders below to control the number of points, the value of parameter *beta*, and the rendering parameters of the graph.
Use the mouse on the graph view to click and drag points around.

Point layout: Grid Rings Random

Number of points: 100

Beta: 1.0

Line width: 2

Point size: 4

Powered by veue.js

http://www.carloscorrea.com/

Beta Skeleton

+

Alcock-Paczynski effect

PUBLIC forero / **BetaSkeleton**

Unwatch 1

The Beta-Skeleton as a cosmological test — Edit

39 commits **1** branch **0** releases **1** contributor

branch: **master** BetaSkeleton /

latest Makefile

forero authored 14 days ago latest commit 20b386d9ec

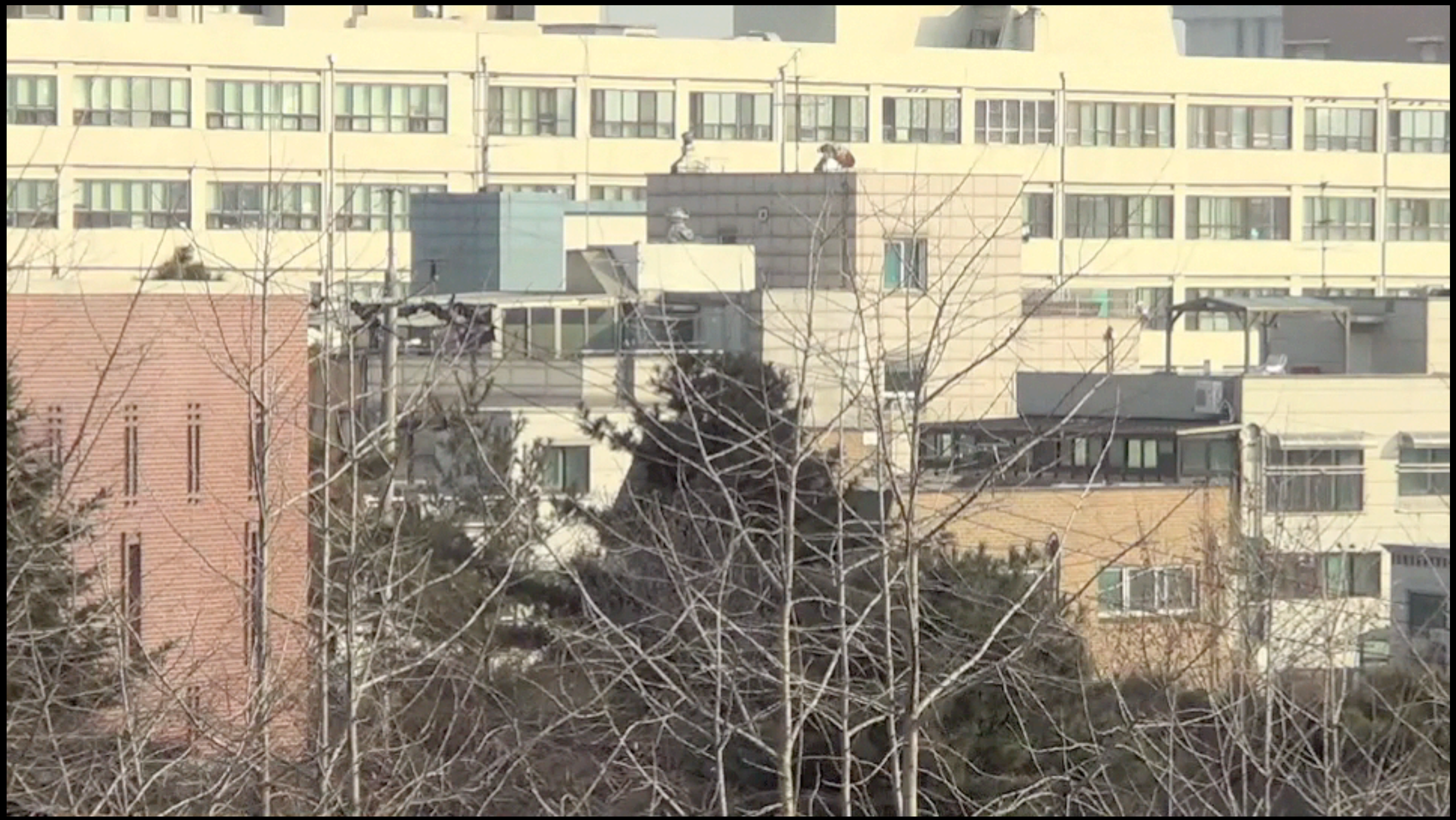
code	latest Makefile	14 days ago
.gitignore	gitignoring	15 days ago
LICENSE	Initial commit	22 days ago
README.md	Initial commit	22 days ago

README.md

BetaSkeleton

The Beta-Skeleton as a cosmological test

https://github.com/forero/BetaSkeleton

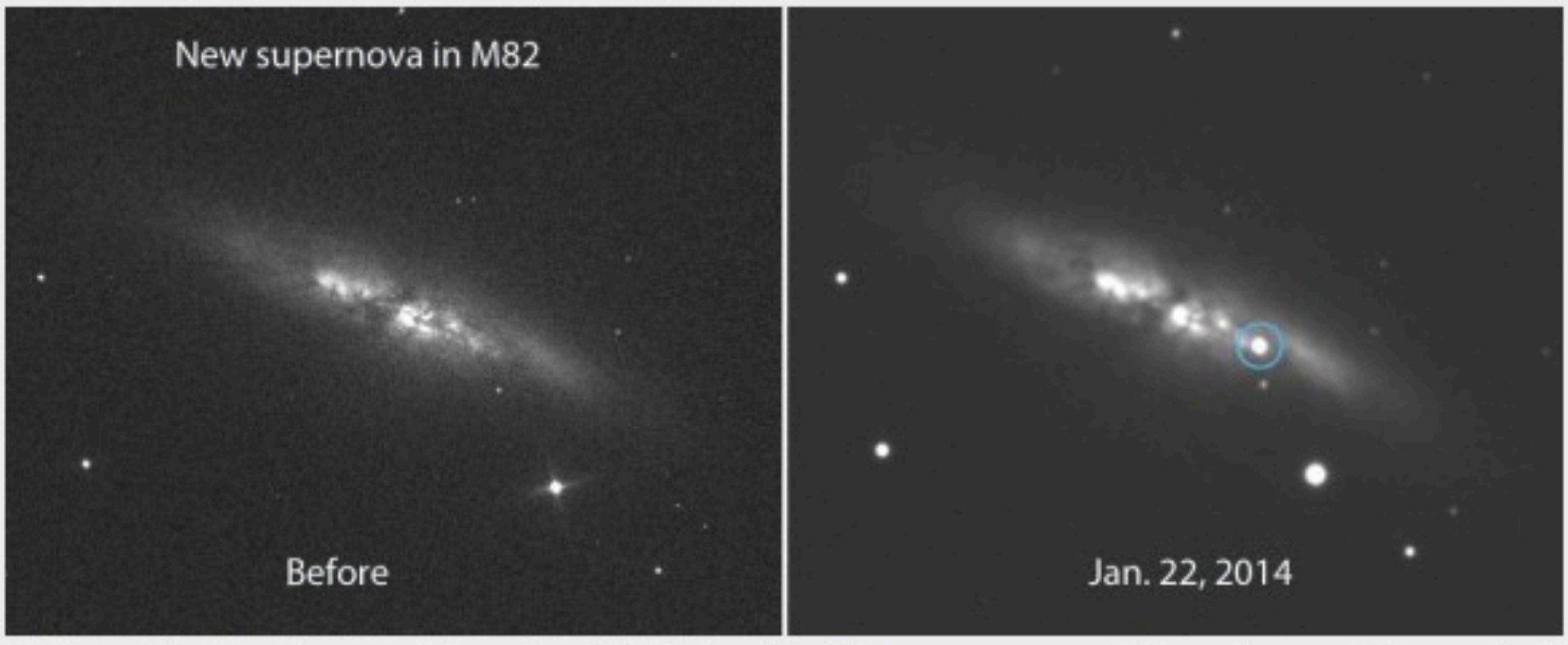


Supernova

Bright New Supernova Blows Up in Nearby M82, the Cigar Galaxy

by BOB KING *on* JANUARY 22, 2014

Want to stay on top of all the space news? Follow **@universetoday** on Twitter



Before and after photos of the galaxy M82 showing the appearance of a brand new 11.7 magnitude supernova. The object is located in the galaxy's plane 54" west and 21" south of its center. Credit: E. Guido, N. Howes, M. Nicolini

Hologramas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Voy a levantar la mano para preguntar: "Profe cósmico, ¿y si el universo que conocemos no es más que una gran proyección holográfica?"
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@Jocantaro Oh.
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Daniel Ramírez @dramirezf Jan 22
@pcastano "La ventaja de los iletrados...".
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Jhon López @JhonLopez_ Jan 22
@pcastano cosa tremenda esa. noticias.tuhistory.com /fisicos-japone…

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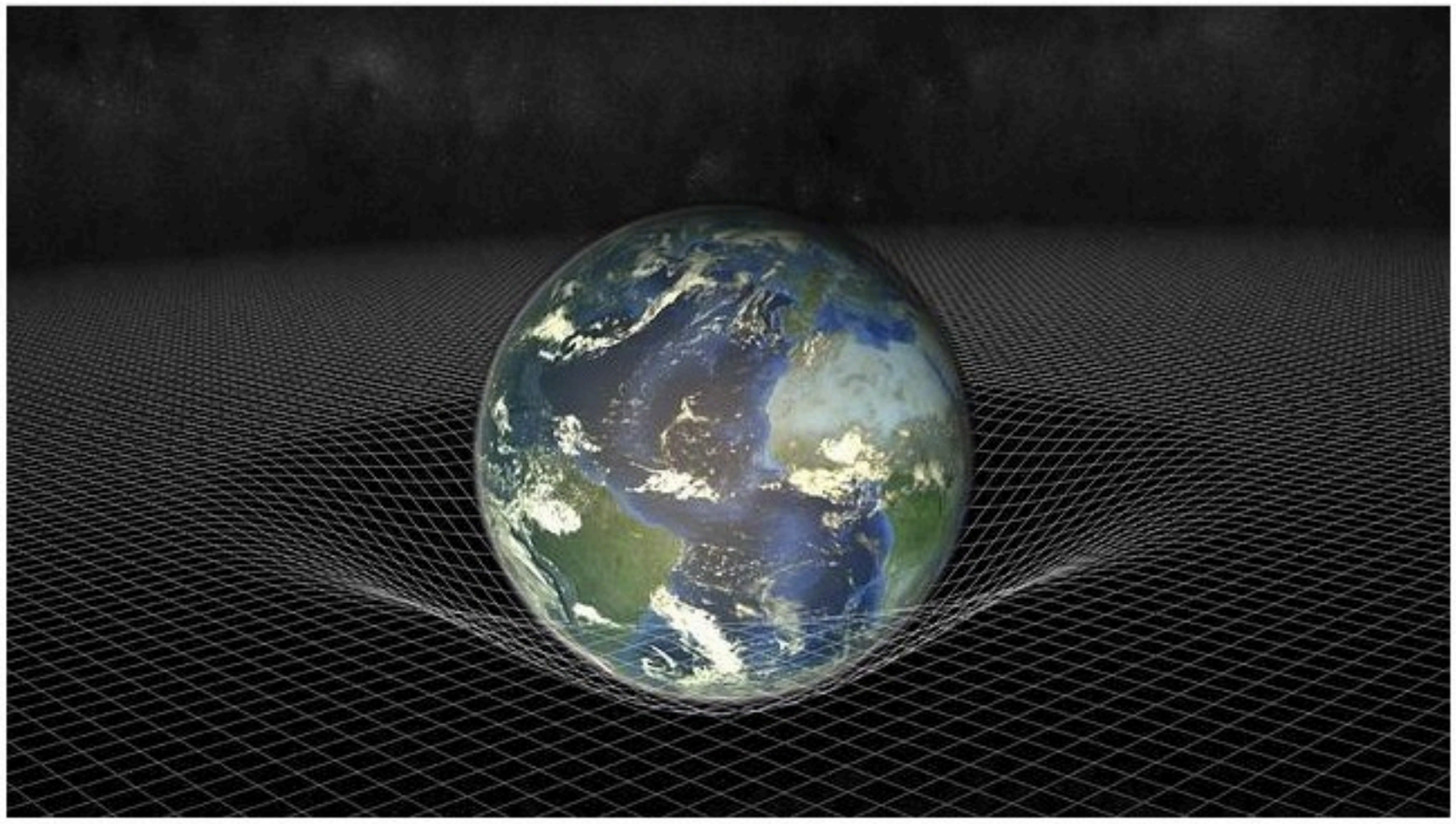
El Universo puede ser un gran holograma

ABC.ES / MADRID | Día 14/12/2013 - 16.09h

TEMAS RELACIONADOS ▸ Física ▸ Ciencia ▸ Astronomía

▸ Físicos japoneses proporcionan nuevas pruebas que respaldan la posibilidad de que todo lo que nos rodea no sea más que una proyección de un cosmos mucho más simple y sin gravedad



ARCHIVO

El Universo que conocemos puede ser una gran proyección holográfica

Quantum Near Horizon Geometry of Black 0-Brane

Yoshifumi Hyakutake

(Submitted on 29 Nov 2013)

We investigate a bunch of D0-branes to reveal its quantum nature from the gravity side. In the classical limit, it is well described by a non-extremal black 0-brane in type IIA supergravity. The solution is uplifted to the eleven dimensions and expressed by a non-extremal M-wave solution. After reviewing the effective action for the M-theory, we explicitly solve the equations of motion for the near horizon geometry of the M-wave. As a result we derive an unique solution which includes the effect of the quantum gravity. Thermodynamic property of the quantum near horizon geometry of the black 0-brane is also studied by using Wald's formula. Combining our result with that of the Monte Carlo simulation of the dual thermal gauge theory, we find strong evidence for the gauge/gravity duality in the D0-branes system at the level of quantum gravity.

AdS/CFT correspondence

From Wikipedia, the free encyclopedia

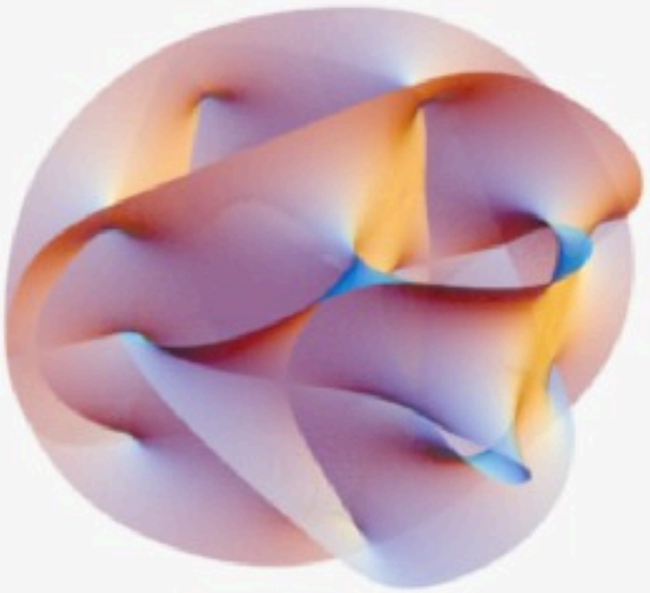
In theoretical physics, the **anti-de Sitter/conformal field theory correspondence**, sometimes called **Maldacena duality** or **gauge/gravity duality**, is a conjectured relationship between two kinds of physical theories. On one side of the correspondence are conformal field theories (CFT) which are quantum field theories, including theories similar to the Yang–Mills theories that describe elementary particles. On the other are anti-de Sitter spaces (AdS) which are used in theories of quantum gravity, formulated in terms of string theory or M-theory.

The duality represents a major advance in our understanding of string theory and quantum gravity.[1] This is because it provides a non-perturbative formulation of string theory with certain boundary conditions and because it is the most successful realization of the holographic principle, an idea in quantum gravity originally proposed by Gerard 't Hooft and improved and promoted by Leonard Susskind.

It also provides a powerful toolkit for studying strongly coupled quantum field theories.[2] Much of the usefulness of the duality results from the fact that it is a strong-weak duality: when the fields of the quantum field theory are strongly interacting, the ones in the gravitational theory are weakly interacting and thus more mathematically tractable. This fact has been used to study many aspects of nuclear and condensed matter physics by translating problems in those subjects into more mathematically tractable problems in string theory.

The AdS/CFT correspondence was first proposed by Juan Maldacena in late 1997. Important aspects of the correspondence were elaborated in articles by Steven Gubser, Igor Klebanov, and Alexander Markovich Polyakov, and by Edward Witten. By 2010, Maldacena's article had over 7000 citations, becoming the most highly cited article in the field of high energy physics.[3]

String theory



Fundamental objects [show]

Perturbative string theory [show]

Non-perturbative results [show]

Phenomenology [show]

Mathematics [show]

Related concepts [show]

Theorists [show]

History · Glossary

V • T • E

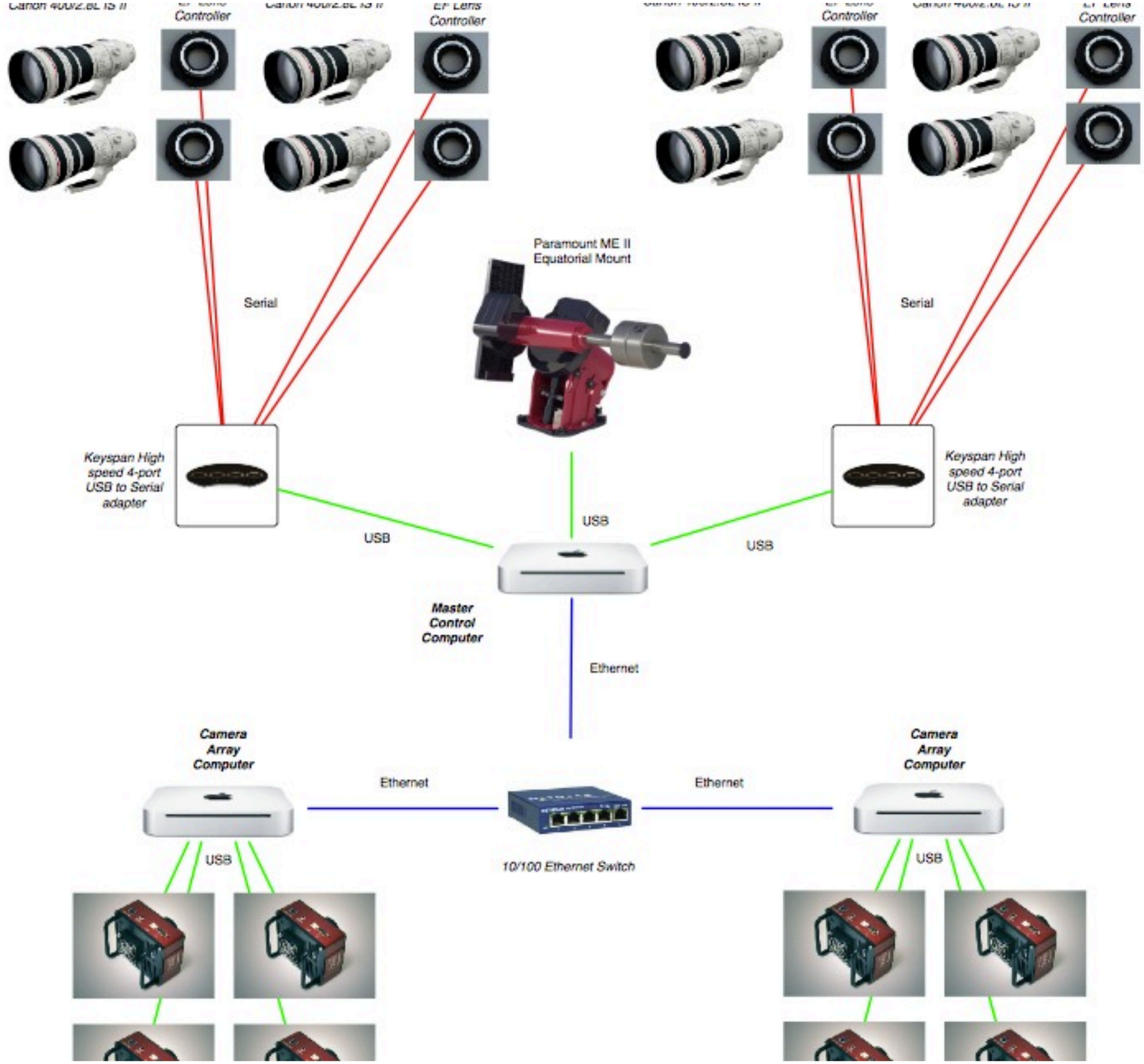
Cerveza

Ultra Low Surface Brightness Imaging with the Dragonfly Telephoto Array

Roberto G. Abraham, Pieter van Dokkum

(Submitted on 21 Jan 2014)

We describe the Dragonfly Telephoto Array, a robotic imaging system optimized for the detection of extended ultra low surface brightness structures. The array consists of eight Canon 400mm f/2.8 telephoto lenses coupled to eight science-grade commercial CCD cameras. The lenses are mounted on a common framework and are co-aligned to image simultaneously the same position on the sky. The system provides an imaging capability equivalent to a 0.4m aperture f/1.0 refractor with a 2.6 deg X 1.9 deg field of view. The system has no obstructions in the light path, optimized baffling, and internal optical surfaces coated with a new generation of anti-reflection coatings based on sub-wavelength nanostructures. As a result, the array's point spread function has a factor of ~10 less scattered light at large radii than well-baffled reflecting telescopes. The Dragonfly Telephoto Array is capable of imaging extended structures to surface brightness levels below 30 mag/arcsec^2 in 10h integrations (without binning or foreground star removal). This is considerably deeper than the surface brightness limit of any existing wide-field telescope. At present no systematic errors limiting the usefulness of much longer integration times has been identified. With longer integrations (50-100h), foreground star removal and modest binning the Dragonfly Telephoto Array is capable of probing structures with surface brightnesses below 32 mag/arcsec^2. Detection of structures at these surface brightness levels may hold the key to solving the "missing substructure" and "missing satellite" problems of conventional hierarchical galaxy formation models. The Dragonfly Telephoto Array is therefore executing a fully-automated multi-year imaging survey of a complete sample of nearby galaxies in order to undertake the first census of ultra-faint substructures in the nearby Universe.


Controller
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Paramount ME II
Equatorial Mount
Keyspan High
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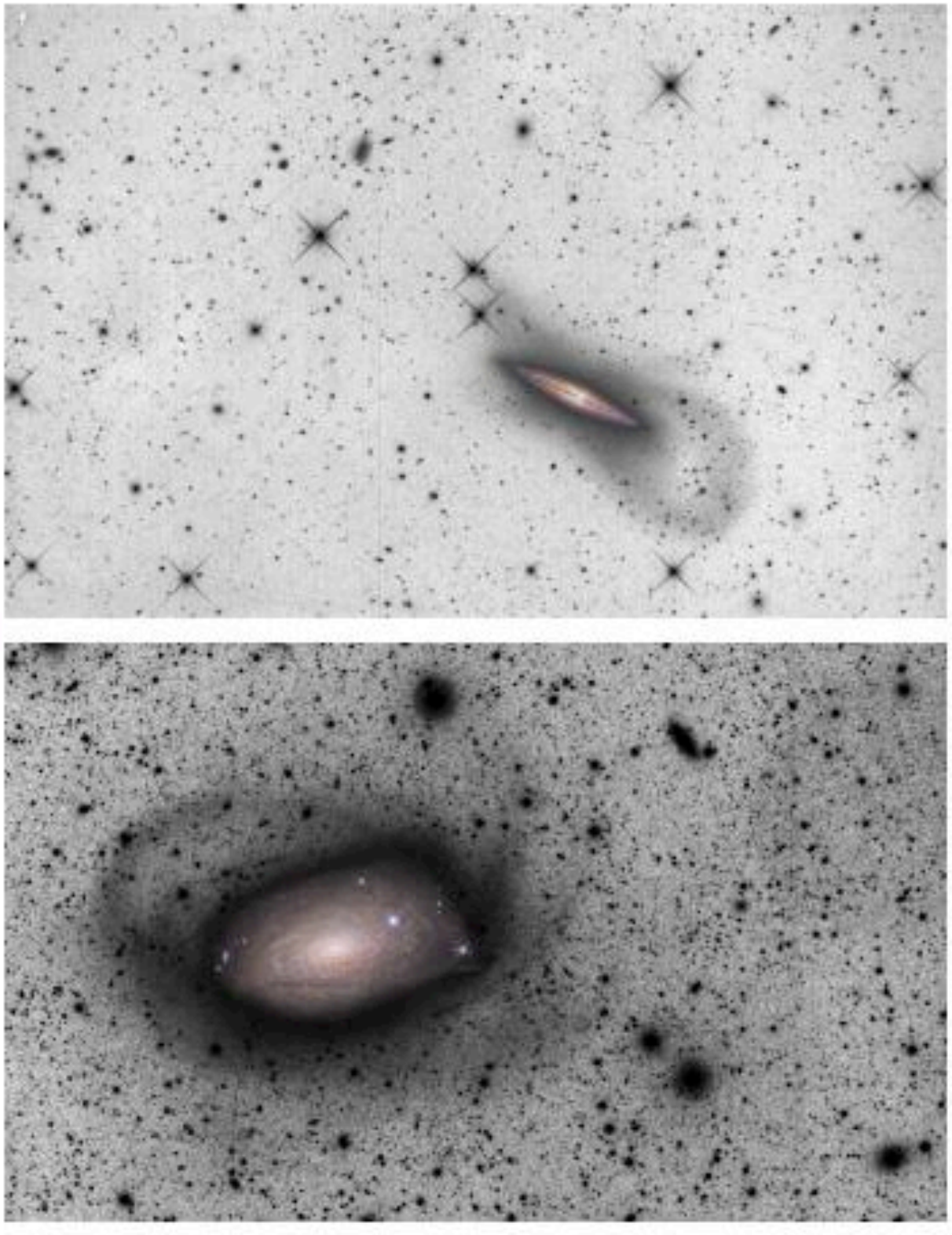

Martinez-Delgado et al.

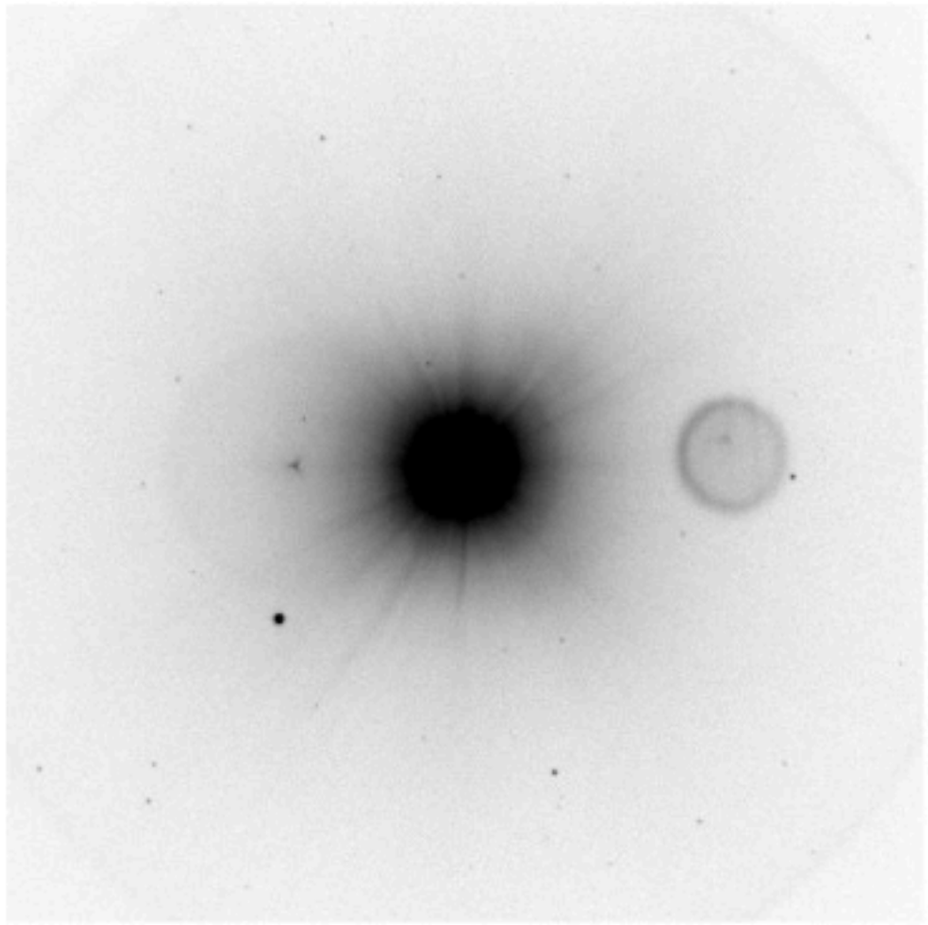

Fig. 8.— A white-light image of the planet Venus, obtained with the one of the Canon 400/2.8 EF IS II telephoto lenses of the Dragonfly Telephoto Array on Nov. 4, 2012. The image spans $50' \times 50'$ is displayed with a logarithmic stretch. The PSF is well behaved out

This project emerged as a result of a bet[20] made by RGA and PGvD at the Mount Everest Nepalese Restaurant on Bloor Street in Toronto. We thank the United Breweries Group of Bangalore for providing us with inspiration on the night in question.