*Chalonge-Héctor de Vega*

***9 de octubre de 2018 de 14:15 hs a 17:30 hs***

***SALA POLIVALENTE DEL CENTRO CULTURAL PASAJE DARDO ROCHA (calle 50 N°575-La Plata)***

PROGRAMA:

14:15 hs. *Acreditación.

14:30 hs.* Palabras de Bienvenida y entrega de Reconocimientos a la Dra. Norma Graciela Sánchez.

Temática a desarrollar: a cargo de la Dra. Sánchez

*Tributo al Dr. Héctor José de Vega (Dr. En Física de UNLP – Director de Investigación Emérito del CNRS de Francia – LPTHE – Université Pierre et Marie Curie -Paris Sorbonne).

*La Escuela Internacional Daniel Chalonge-Héctor de Vega desde sus orígenes hasta nuestros días, 27 años de actividad. El modelo Standard del Universo, Stephen Hawking y 4 premios Nobel de Física.

*La Física del Universo desde sus orígenes hasta nuestros días: Una historia de 13.700 millones de años.

*Los agujeros negros en todos sus estados desde sus orígenes hasta nuestros días.

**ENTRADA LIBRE Y GRATUITA.**

Prohibido el ingreso a la sala con bebidas y/o alimentos.

# Escuela International Daniel Chalonge
# Héctor de Vega

## Ciencia con una gran exigencia intelectual y valor humano


## Una gran aventura científica y humana

## PROGRAMA PRIMAVERA 2018

### ENSENADA, LA PLATA, BUENOS AIRES, PARIS

### acceso libre y gratuito

# *Tribute to Héctor J. de Vega*

# *The scientist and the human person*

***https:chalonge-devega.fr/HdeV.html***


- Ecole Internationale

Daniel Chalonge – **Héctor de Vega**

- **Médaille Héctor J. de Vega** acuñada en Francia

- **Bibliothèque Héctor J. de Vega**

en su laboratorio LPTHE CNRS UPMC Sorbonne Université en Paris

https://chalonge-devega.fr/Programme2018.html

https://chalonge-devega.fr/

https://chalonge-devega.fr/HdeV.html

## La Medalla Daniel Chalonge y la Medalla Héctor de Vega

## Medallas de la Escuela Chalonge - de Vega:

**Subramanyan CHANDRASEKHAR, Premio Nobel de Fisica**

**Bruno PONTECORVO.**

**George SMOOT, Premio Nobel de Fisica**

**Carlos FRENK. Anthony LASENBY.**

**Bernard SADOULET, Fellow of the USA Academy of Arts And Sciences.**

**Peter BIERMANN.**

**John MATHER, Premio Nobel de Fisica**

**Brian SCHMIDT, Premio Nobel de Fisica**

**Gérard GILMORE, Fellow of the UK Royal Astronomical Society**

**Héctor J. DE VEGA.**

**Nicholas KAISER, Fellow of the UK Royal Astronomical Society.**

# Héctor J. de Vega

Norma G. Sanchez et l'Ecole Internationale Daniel Chalonge ont l'immense douleur d'annoncer le décès de Héctor J. de Vega, directeur de recherche émérite au CNRS, au LPTHE UPMC Paris 6 et associé au LERMA Observatoire de Paris, le dimanche 10 mai après un combat jusqu'au bout et sans merci contre la maladie. Il venait d'avoir 66 ans.

Docteur es Sciences Physiques de l'Université Nationale de La Plata avec médaille d'or, puis séjourne au LPT ENS Paris, au SphT CEA Saclay Orme des Merisiers, et devient chercheur au CNRS au LPTHE UPMC.

Né à Buenos Aires, dans une famille d'intellectuels et chercheurs de grande culture,le jeune Héctor appelé « le savant », voyage avec ses parents en Europe et par le monde. Plusieurs villes de l'Argentine lui sont associées : Buenos Aires, La Lucila, La Plata, Ensenada, Olavarria.

Physicien théoricien hors pair, physicien de l'univers, esprit indépendant, d'une cohérence et d'une force intellectuelles majeures, prestige scientifique et personnel, il a vécu et travaillé sans relâche, portant très haut les valeurs de la Science et de l'Ecole Daniel Chalonge où il excellait dans tous ses aspects.

Il a développé plusieurs vies scientifiques avec des recherches pionnières dans différentes spécialités et grande vision d'évolutions thématiques : Théorie quantique des champs, modèles intégrables, physique des particules et physique statistique, théorie des cordes, cosmologie, théorie de l' inflation de l'univers confrontée aux observations du fond cosmique micro-onde, matière noire tiède dans les galaxies, avec des méthodes novatrices de calcul analytiques puissantes très sophistiquées.

Dans toutes ces thématiques, il a formé des étudiants, dirigé des doctorants, jeunes chercheurs, et eu des collaborations internationales importantes.

Il a combattu jusqu'à la dernière minute l'agressivité de la maladie, démontrant une capacité exceptionnelle à surmonter les épreuves, et a conservé son sourire de bonté jusqu'au bout.

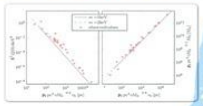
L'Ecole Chalonge rend hommage à son plus grand pilier, scientifique avec une très grande exigence intellectuelle et visage humain. Le programme 2015 lui est dédié, des hommages lui seront rendus dans les divers colloques et séances.

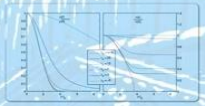
**Héctor,** tu es maintenant dans l'éternité. Repose en paix.

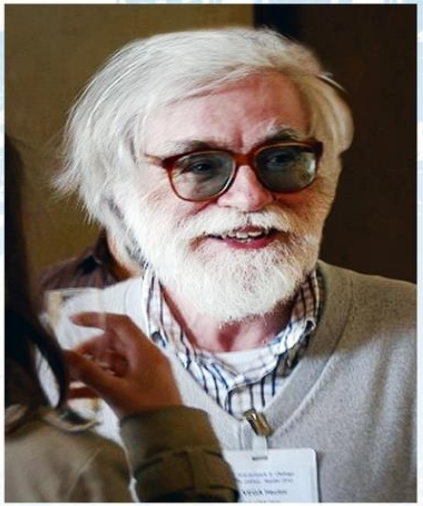
10, 11, and 12 June 2015

CIAS Observatoire de Paris, Château de Meudon

# WARM DARK MATTER GALAXIES IN AGREEMENT WITH OBSERVATIONS:CMB, GALAXIES, BLACK HOLES, AND STERILE NEUTRINOS







In the honor of
**HECTOR J. DE VEGA**
the scientist and human person

## PROGRAM AND LECTURERS

- Peter BIERMANN (MPI-Bonn, Germany & Univ of Alabama, Tuscaloosa, USA)
  Warm Dark Matter and its astrophysical signatures.
- Dietrich BODEKER (Fakultaet fuer Physik, Universitaet Bielefeld, Germany)
  Non-relativistic Leptogenesis and heavy neutrinos
- Daniel BOYANOVSKY (Univ. of Pittsburg, Dept of Physics and Astronomy, USA)
  Cosmological implications of light sterile neutrinos produced after the QCD phase transition
- Hector J. DE VEGA (CNRS LPTHE Univ de Paris VI, France)
  The Structure of Galaxies in keV Fermionic Warm Dark Matter : Classical and Quantum regimles
- Anastasia FIALKOV(Départment de Physique ENS Paris France)
  Signatures and constraints on Warm Dark Matter scenarios from reionization, 21-cm, first galaxies
- Loredana GASTALDO (Kirchhoff Institute for Physics KIP, Univ Heidelberg, Germany)
  The Status of the ECHO experiment for the investigation of keV sterile neutrinos
- Hareth MAHDI (Sydney Institute for Astronomy, University of Sydney, Australia)
  Gravitational Lensing in Warm Dark Matter and Evolving Dark Energy Cosmologies
- Shunsaku HORIUCHI (Dept. of Physics & Astronomy, Univ. of California, Irvine, CA, USA)
  keV Sterile neutrino Warm Dark Matter bounds from Galaxies of the Local Group
- Thierry LASSERRE (CEA, IRFU-Saclay, France)
  Sterile Neutrino experiments : A Status Report
- Marco LOMBARDI (Dept. of Physics,University of Milano, Italy)
  Filaments, Surface density and Scaling laws in Star and Structure formation: Density Models fitted to Observational Data
- Maxim MARKEVITCH (NASA/Goddard Space Flight Center, Greenbelt, MD, USA)
  The 3.5 keV emission line in the X-ray spectrum of galaxy clusters, results and controversies
- Nicola MENCI (INAF, Osservatorio di Roma, Roma, Italy)
  Galaxy and Star formation in Warm Dark Matter Cosmology
- Susanne MERTENS (Inst. for Nuclear & Particle Astrophysics, LBNL Berkley, CA, USA)
  keV Sterile neutrino Warm Dark Matter searches with Tritium Beta Decay experiments
- Sinziana PADUROIU (Observatoire de Geneve, Switzerland)
  Numerical Simulations on Structure Formation in Warm Dark Matter Cosmology
- Manolis PAPASTERGIS (Kapteyn Institute, Univ of Groningen, Netherlands)
  Dark matter implications from the ALFALFA 21 cm survey
- Brigitte ROCCA-VOLMERANGE (Univ Paris-Sud & IAP, Paris, France)
  The Supernova Remannent Mass accumulated along the star formation history of z=3.8 Radio Galaxies and its implications
- Paolo SALUCCI (SISSA-Astrophysics, Trieste, Italy)
  Testing Warm Dark Matter with Galaxy observations at high redshifts
- Norma G. SANCHEZ (CNRS LERMA Observatoire de Paris, Paris, France)
  The Thomas Fermi keV Warm Dark Matter Galaxy Theory in agreement with observations: Quantum macroscopic effects and New Results

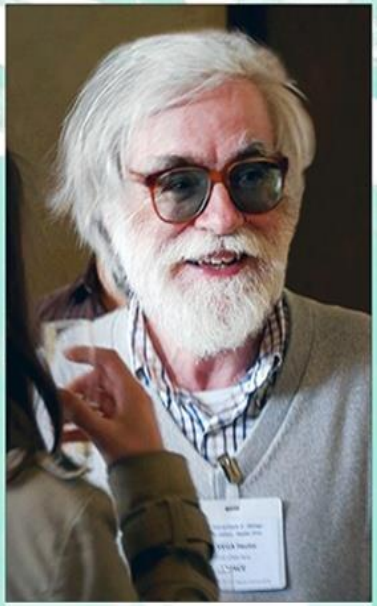
### SOC AND LOC

N. G. SANCHEZ, H. J. de VEGA, P. BIERMANN, C. FALVELLA, N. LETOURNEUR, J. BERTHIER, S. CNUDDE, E. VERGNAUD, D. ZIDANI.

l'Observatoire de Paris · LERMA · UPMC Paris Universitas · LPTHE · CNRS · MAIRIE DE PARIS · ACAV · ile de France

Maquette : J. Berthier, direction artistique : E. Vergnaud

# LATEST NEWS FROM THE UNIVERSE: LAMBDA WARM DARK MATTER COSMOLOGY (ΛWDM), CMB, DARK MATTER, DARK ENERGY, AND STERILE NEUTRINOS



*In the honor of Hector J. de Vega, the scientist and human person.*

## PROGRAM AND LECTURERS

- Peter BIERMANN (Chalonge Medal, MPI-Bonn, Germany & Univ of Alabama, Tuscaloosa, USA)
  Cosmological and astrophysical signatures of Warm Dark Matter

- Esra BULBUL (Harvard-Smithsonian Center for Astrphysics, Cambridge, Ma, USA)
  The 3.5 keV emission line in the X-ray spectrum of galaxy clusters

- Asantha COORAY (University of California, Irvine, USA)
  The Extragalactic Background Light and New Results with CIBER

- Hector J. DE VEGA (CNRS LPTHE Univ de Paris VI, France)
  Fermionic Warm Dark Matter and the Thomas-Fermi galaxy structure theory

- Guido DREXLIN (NP-KIT-KACETA, Karlsruhe, Germany)
  The Karlsruhe Tritium Neutrino experiment KATRIN and its Science case

- Gerard F. GILMORE (Chalonge Medal, Institute of Astronomy, Cambridge University, UK)
  Cosmology with Gaia

- Anthony N. LASENBY (Chalonge Medal, Cavendish Laboratory, Cambridge, UK)
  CMB Observations and its implications: A Status Report

- Alessandro MELCHIORRI (Univ. Roma 1 La Sapienza, Italy)
  The cosmological data set analysis with Neutrinos and Sterile Neutrinos

- Clem PRYKE (University of Minnesota, Dept of Physics, Minneapolis MN, USA)
  BICEP/KECK

- Paolo SALUCCI (SISSA-Astrophysics, Trieste, Italy)
  Galaxy structure observations and Cored Density Profiles

- Norma G. SANCHEZ (CNRS LERMA Observatoire de Paris, France)
  Warm Dark Matter Galaxies and Supermassive Black holes in agreement with observations. New Results

- George F. SMOOT III Chalonge Medal, Nobel prize of Physics (BCCP LBL Berkeley, IEU Seoul, Univ Paris Diderot USA). Open Lecture: Last news of the CMB

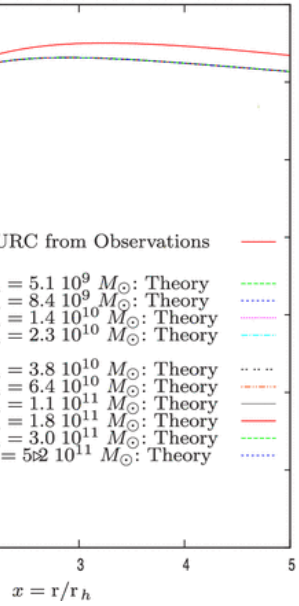
- George SONNEBORN (NASA/Goddard Space Flight Center, Greenbelt, MD, USA)
  Open Session: The James Webb Space Telescope

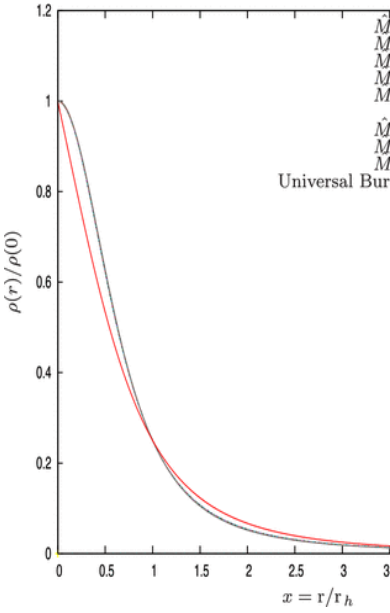
- SPIDER : CMB Polarization

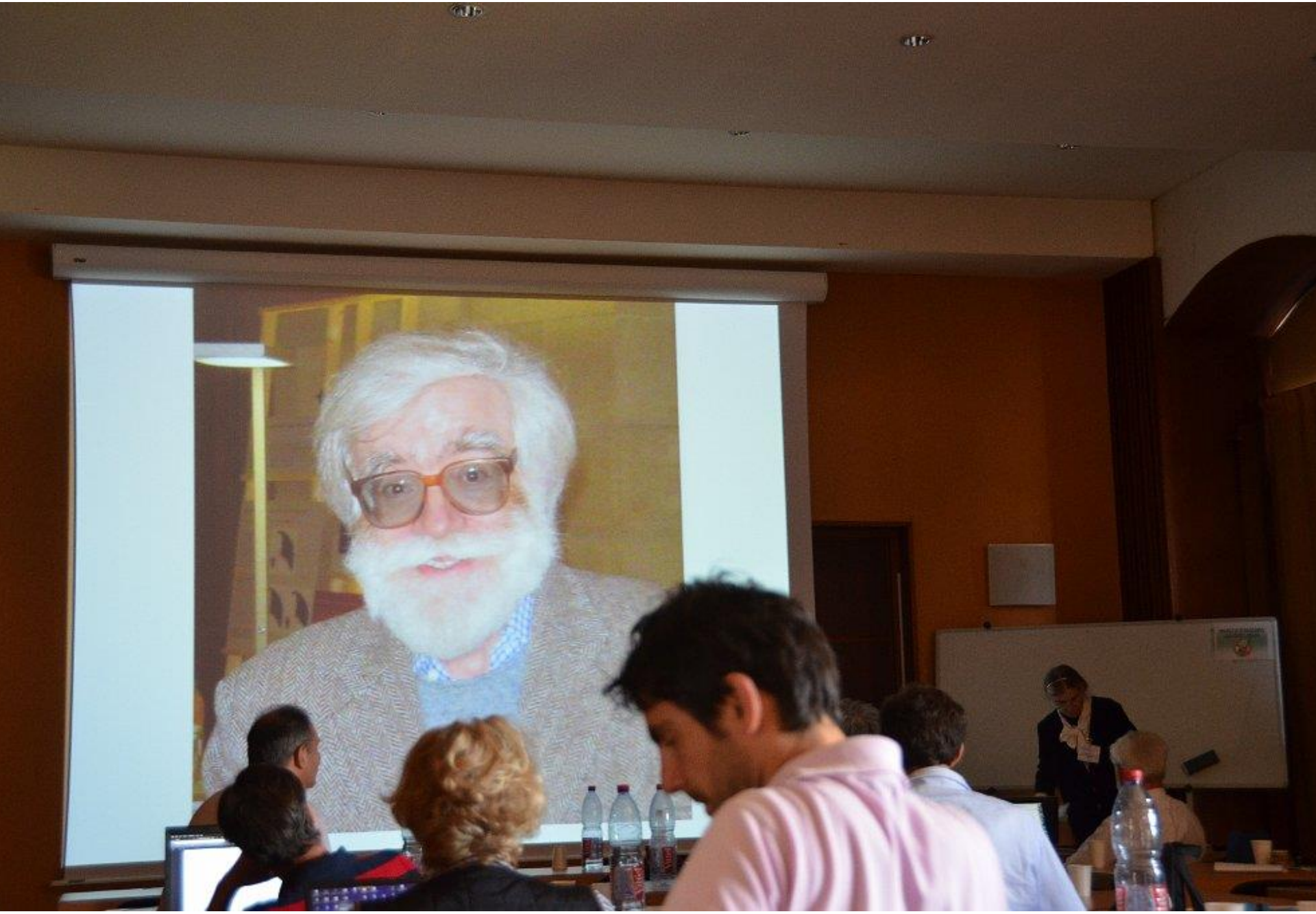
- Christopher G.TULLY (Dept. of Physics, Princeton University, NJ, USA)
  Searching for Sterile Neutrinos with Calorimetric Methods at PTOLEMY

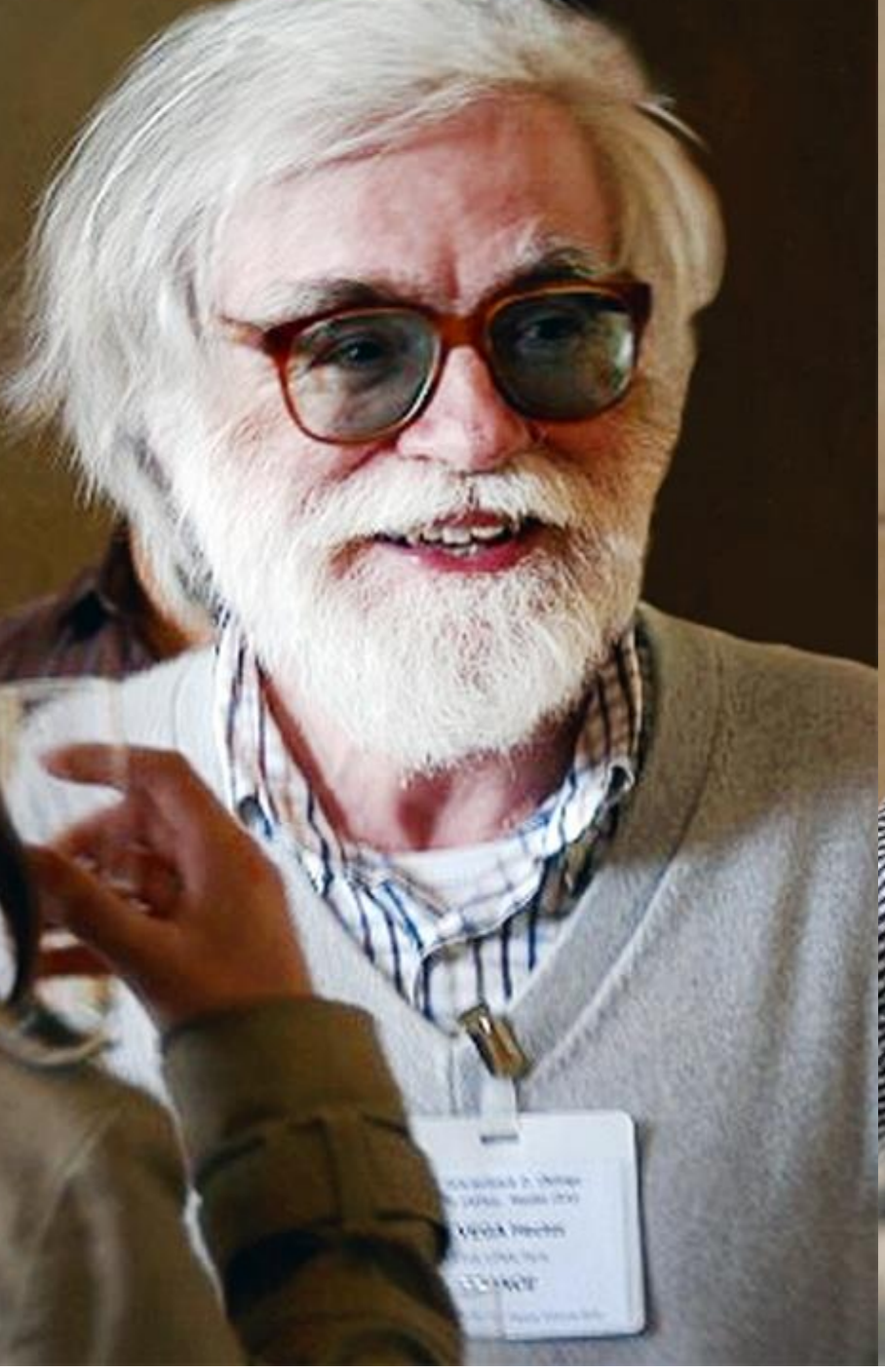
- Casey WATSON (Millikin Univ, Dept Physics & Astron., Decatur, Illinois, USA)
  Observational Constraints on keV Sterile Neutrinos

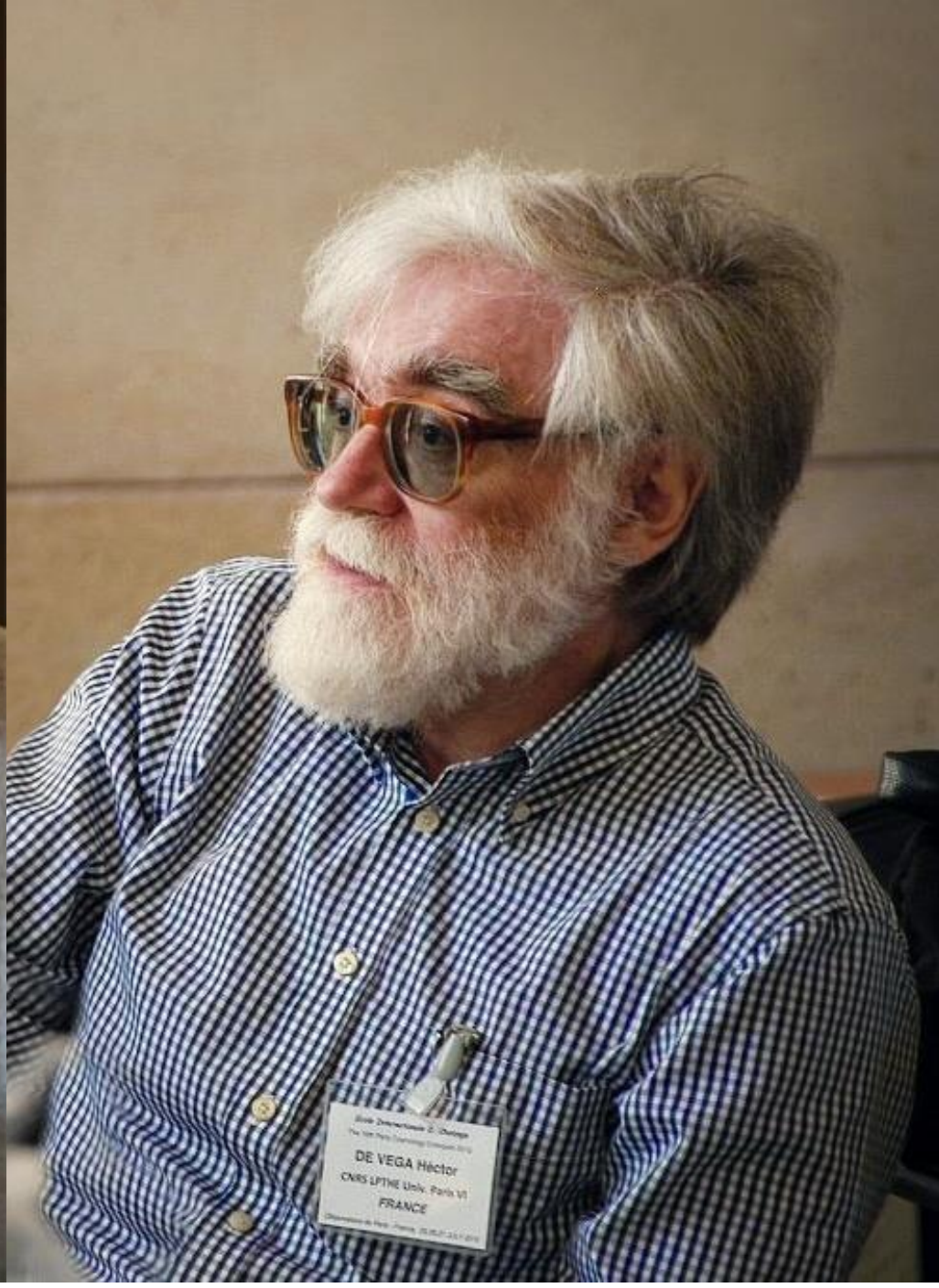
# *Newton, Fermi and Dirac, meet together in Galaxies through keV Warm Dark Matter*






DE VEGA Héctor
CNRS LPTHE Univ. Paris VI
FRANCE

***Ciencia con gran exigencia intelectual, rostro y valor humano***

***Science with great intellectual endeavour and a human face***


Daniel Chalonge : scientist and
Daniel Chalonge and new instruments


DE VEGA Hector J.
FRANCE


Daniel Chalonge

**Chalonge Meudon Workshop 2013. Warm Dark Matter in Galaxies in agreement with Observations**

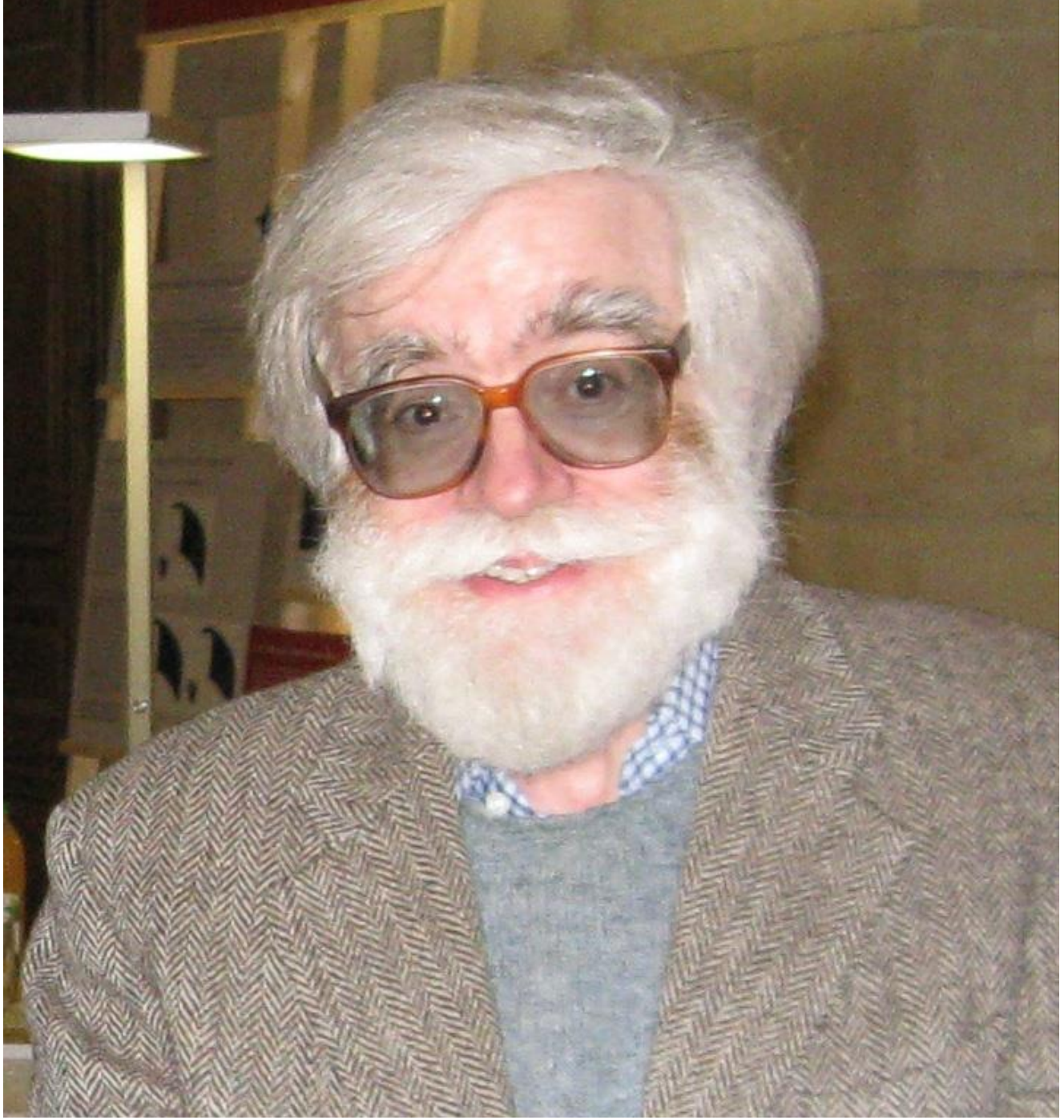
**Chalonge 17h Paris Colloquium July 2013. Les participants, dont les trois laureats du prix Nobel de Physique en Cosmologie 2004-2012 réunis sur la méridienne de Paris .**

*Le Gentilhomme de la Science*

*The Gentleman of Science*

*El Gentilhombre de la Ciencia*

*El Caballero de la Ciencia*




DE LA ENSENADA
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CC


CIÓN

PARIS - MEUDON COLLOQUIUM 22 - 26 SEPTEMBER 1986

# Archives Sanchez de Vega

**Choloque pionnier de 1986: “String Theory, Quantum Gravity and Quantum Cosmology, Integrable and Conformal Invariant Theories”**

**En bas: Norma Sanchez, Jane Wilde Hawking, Stephen Hawking, une assistante.**
**En haut à gauche: Héctor de Vega, à son coté Jean-François Augereau (journal Le Monde).**
**Moitié droite: Gary Gibbons, Chris Pope, Kellogg Stelle, Stanley Deser, J. Harnad, Helmut Rumpf, Tom Curtright, Jean Heidmann, Paolo Di Vecchia, Vladimir Rittenberg, Bernard Whiting, …, Dieter Maison, J-Pierre Antoine,… Peter Aichelburg, Gerhard Schafer, P. Ruback, Don Page, E. Corrigan,… M. Umezawa,…, J. Kijowski, Michael Karowski, Karl Rehren ....**
**Moitié gauche: Renato Musto, Jean Avan, un assistant de Stephen Hawking, Charles Nash,…,Carl Bender,…, Roberto Pettorino, Jan Moss, Antonio Segui, David Olive, Ulf Lindström, Holger Nielsen, Antoine Van Proeyen…, Robert Pisarski, Hugh Osborn, M. Costa, Anne Magnon, Claudio Destri...., Héctor de Vega, Jean-François Augereau.**
**….Parmi les participants et conferenciers du colloque absents sur la photo…. John G. Taylor, François Englert (prix Nobel de Physique 2013), Claude Itzykson, Jean Lascoux, Pierre Fayet,…**

*Proceedings of the Paris – Meudon Colloquium*
*22-26 September 1986*

# STRING THEORY
# QUANTUM COSMOLOGY AND QUANTUM GRAVITY
# INTEGRABLE AND CONFORMAL
# INVARIANT THEORIES

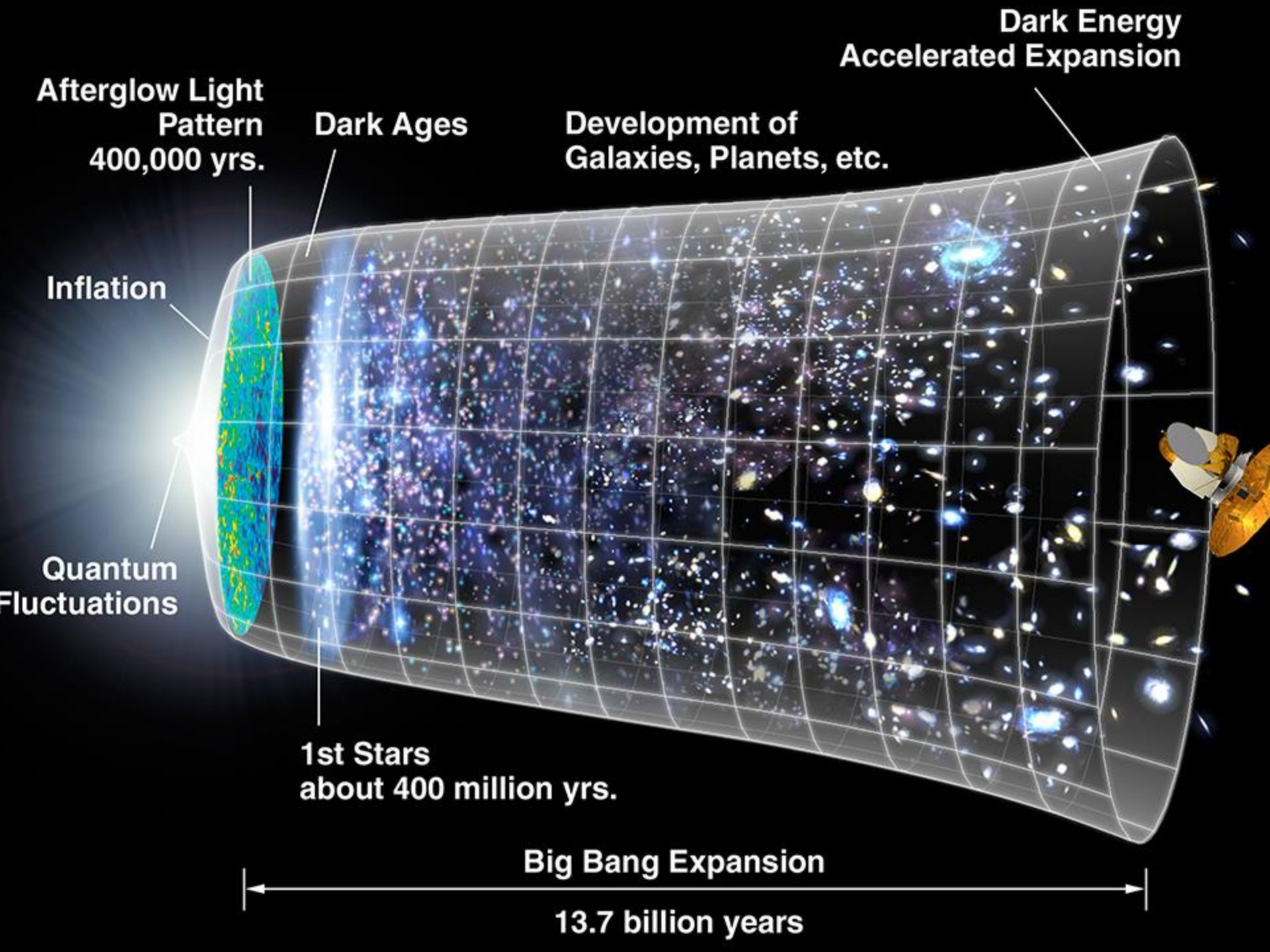
*Editors:* ***H. J. de Vega***
***N. Sánchez***

**World Scientific**

**Inauguration of the Chalonge School : First course on Astrofundamental Physics, septembre 1991.**

**De gauche à droite et de bas en haut: Turner, Mme Chandrasekhar, Chandrasekhar, Sanchez, Smoot, Khalatnikov, Einasto, Divan, Pontecorvo, Turok, Frenk, Kibble, Fehrenbach, De Greiff, Lousto', de Vega, Stompor, Cayrel, Mollerach, ...Nusser, ..Amendola,, Mme Ferenbach, Jaffe, Müller, Giovannini, Taylor, Haxton, Hua, Astone, Dressler, Pizzella, Gabriele, Joffe, Dettki, Jaffe, Muriel, Bertschinger, Ormes, Grishsuk, Hearnshaw, Easther, Sadoulet, Silk, Roulet, Harari,..., hors champ: Audouze, Bergmann et Mme, Fang Li Zhi, Richards, Schatzman, Weber,.....**

**<u>Chalonge School 2nd course on Astrofundamental Physics, septembre 1992.</u> De gauche à droite et de bas en haut: Bergmann, Hogan, Dekel, Lynden-Bell, Frenk, Smoot, Sanchez, Pontecorvo, Israel, Kolb, Schramm, Ramond, Fishman, Lousto', Campanelli, Mme Bergmann, Mosconi, Falvella,Signore, Bottinelli, Gouguenheim, de Vega, Khalatnikov, Vittorio, Lasenby, Shapiro, Weekes,Salopek, Schmid, Grabar, Pontecorvo Jr, Einasto, Dubrovich, .... Boyanovsky, Parijskij, Prokopek,Peltoniemi, ..., Dettki, Levinas, Magueijo, .,.., ., Nicolaidis, Brandenberger, Giovannini, ....Copeland,..., Blumenfeld, Gottlöber, Hartman, ..., Muriel, Kogut, Grindlay, ...Cappozzielo,..., Donzelli, Easther,...., hors champ: Rowan-Robinson, Frolov, , Danzmann, Schönfelder**


Dark Energy
Accelerated Expansion
Afterglow Light
Pattern
400,000 yrs.
Dark Ages
Development of
Galaxies, Planets, etc.
Inflation
Quantum
Fluctuations
1st Stars
about 400 million yrs.
Big Bang Expansion
13.7 billion years

# LE TEMPS: CONCEPTS

- CAUSALITE, VITESSE MAXIMALE: c. PASSE, PRESENT, FUTURE: CONE DE LUMIERE

- IRREVERSIBILITE : LA FLECHE DU TEMPS
- →→→

- L'UNIVERS évolue DU DESORDRE VERS l'ORDRE (DU CHAOS VERS l'STRUCTURATION ): => ENTROPY, toujours CROIT

- LA GRAVITATION ESPACE-TEMPS

- CLASSIQUE vs QUANTIQUE

- LE TEMPS est un concept CLASSIQUE
- EMERGE a partir du QUANTIQUE
- ORIGIN DU TEMPS
- VIDE (RIEN) : VIDE QUANTIQUE (pas de temps)=>
- EMERGENCE du TEMPS

# THE HISTORY OF THE UNIVERSE IS A HISTORY of EXPANSION and COOLING DOWN

## THE EXPANSION OF THE UNIVERSE IS THE MOST POWERFUL REFRIGERATOR

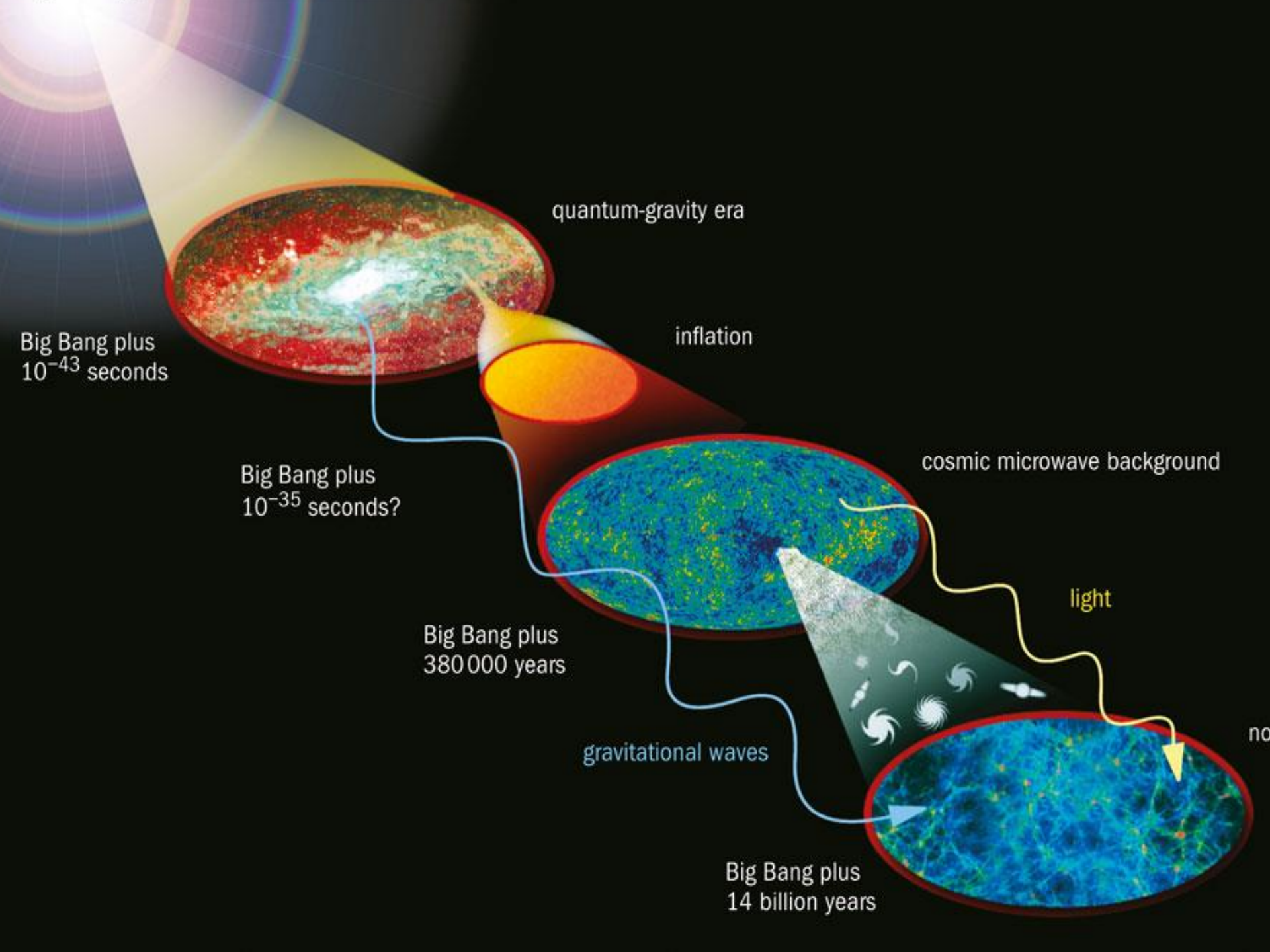
**INFLATION PRODUCES THE MOST POWERFUL STRETCHING OF LENGTHS**

## THE EVOLUTION OF THE UNIVERSE IS FROM QUANTUM TO SEMICLASSICAL TO CLASSICAL

**From Very Quantum (Quantum Gravity) state to Semiclassical Gravity (Inflation) stage (Accelerated Expansion) to Classical Radiation dominated Era followed by Matter dominated Era (Deccelerated expansion) to Today Era (again Accelerated Expansion)**

## THE EXPANSION CLASSICALIZES THE UNIVERSE

## THE EXPANSION OF THE UNIVERSE IS THE MOST POWERFUL QUANTUM DECOHERENCE MECHANISM


quantum-gravity era
Big Bang plus
$10^{-43}$ seconds
inflation
Big Bang plus
$10^{-35}$ seconds?
cosmic microwave background
light
Big Bang plus
380 000 years
gravitational waves
Big Bang plus
14 billion years

# Two key observable numbers :

## associated to the primordial density and primordial gravitons :

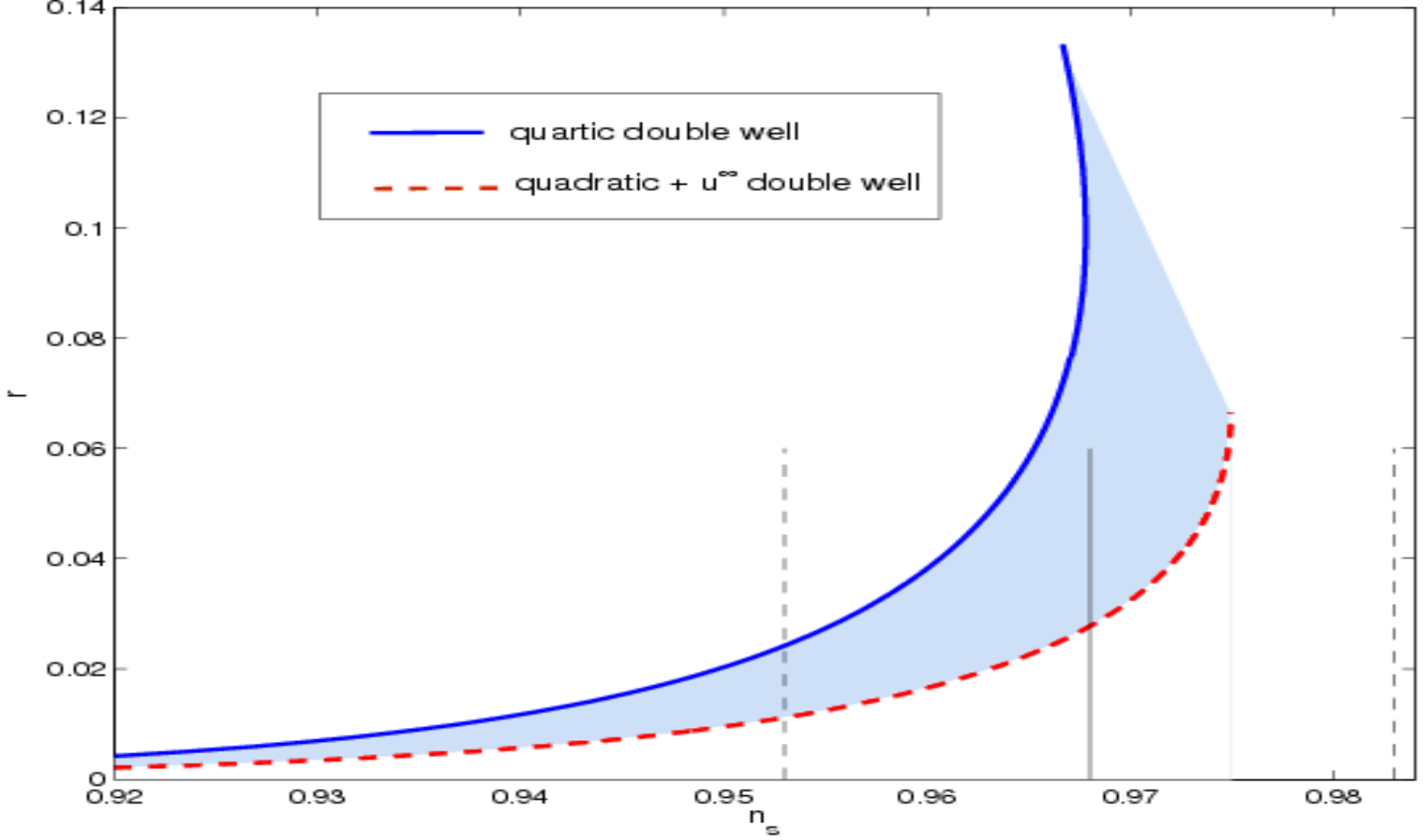
## OUR THEORETICAL PREDICTIONS

$$n_s = 0.9608 , \quad r \sim 0.04$$

$$0.021 < r < 0.059$$

Destri, de Vega, Sanchez & from WMAP data
(Phys Rev D 2008)

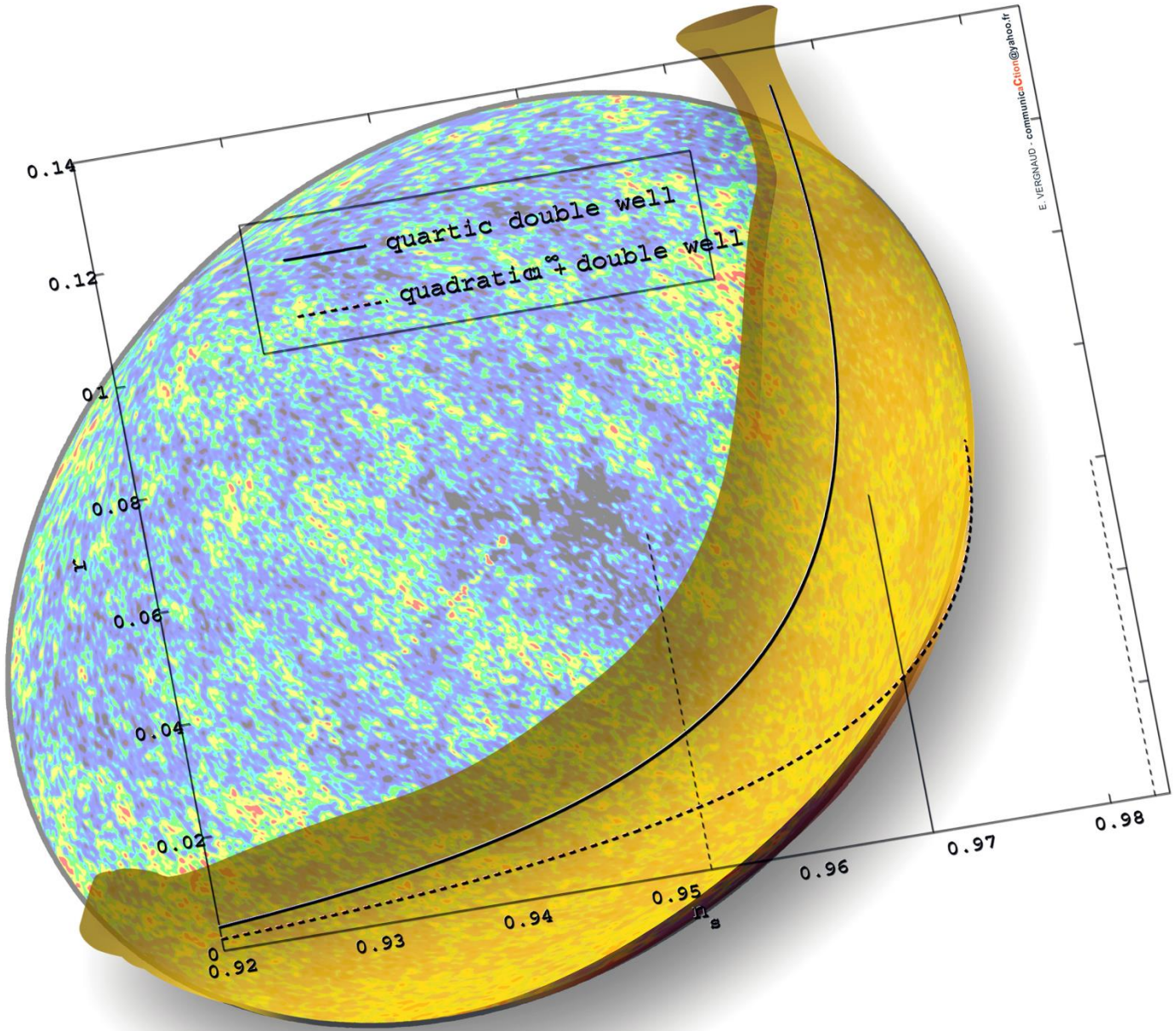
Planck-BICEP2-Keck 2015: $r < 0.08$




# THE PRIMORDIAL COSMIC BANANA

**The tensor to scalar ratio r (primordial gravitons) versus the scalar spectral index n_s. The amount of r is always non zero**

**H.J. de Vega, C. Destri, N.G. Sanchez, Annals Phys 326, 578(2011)**


quartic double well
quadratic + double well
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
r
0.92
0.93
0.94
0.95
0.96
0.97
0.98
$n_s$
E. VERGNAUD - communicCtion@yahoo.fr

# BLACK HOLE EVAPORATION DOES THE INVERSE EVOLUTION OF THE UNIVERSE:

**BLACK HOLE EVAPORATION GOES FROM CLASSICAL/SEMICLASSICAL STAGE TO A QUANTUM (QUANTUM GRAVITY) STATE,**

**Through this evolution, the Black Hole temperature goes from the semiclassical gravity temperature (Hawking Temperature) to the usual temperature (the mass) and the quantum gravity temperature (the Planck temperature).**

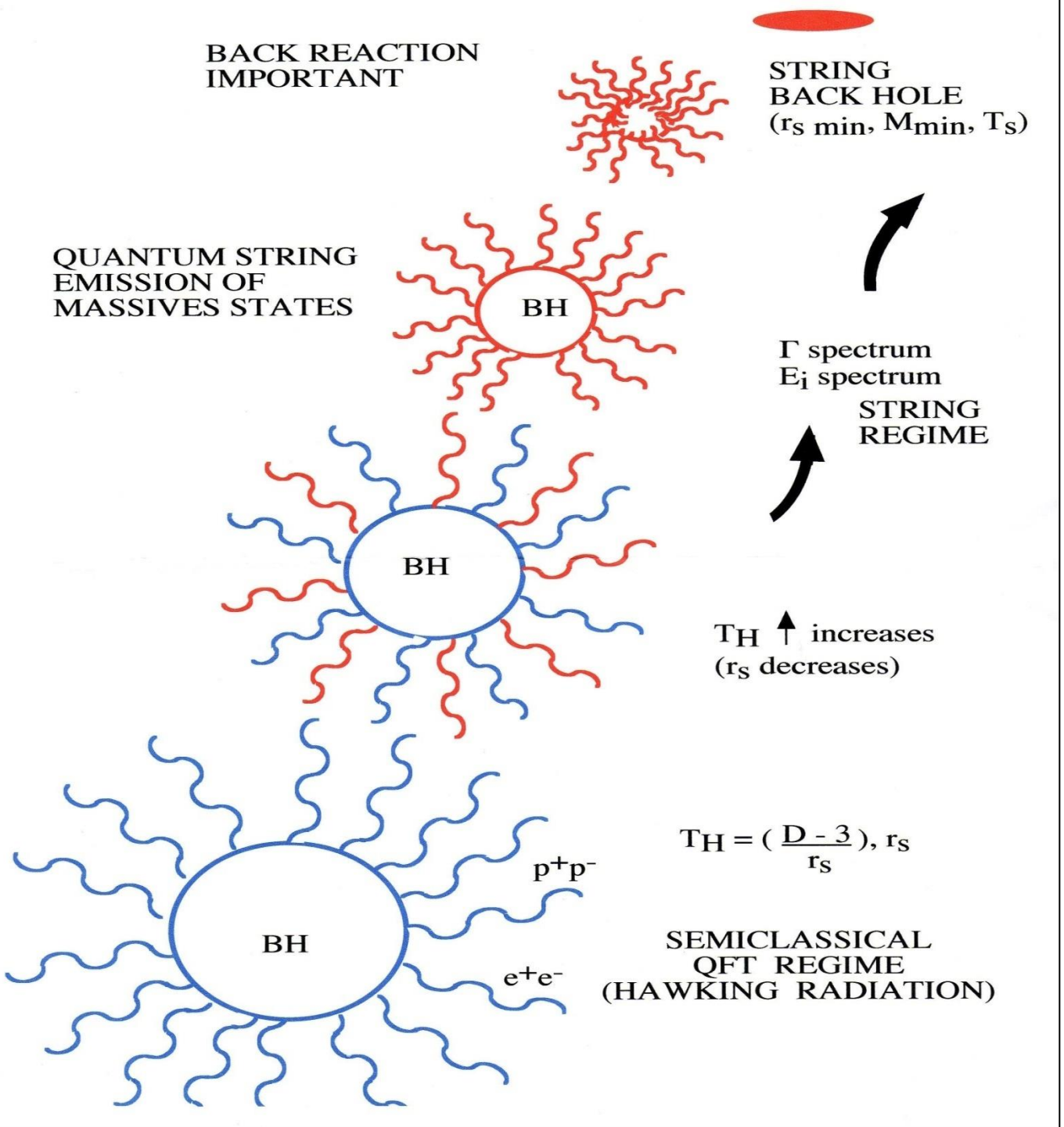
**Conceptual unification of quantum black holes, elementary particles and quantum states**

# CONCEPTUAL UNIFICATION

- **Cosmological evolution goes from a quantum gravity phase to a semi-classical phase (inflation) and then to the classical (present cosmological) phase.**

- **Black Hole Evaporation (BH hole decay rate), heavy particles and extended quantum decay rates; black hole evaporation ends as quantum extended decay into pure (non mixed) non thermal radiation.**

- **The Hawking temperature, elementary particle and Hagedorn (string) temperatures are the same concept in different gravity regimes (classical, semiclassical, quantum) and turn out to be the precise classical-quantum duals of each other.**


BACK REACTION
IMPORTANT
STRING
BACK HOLE
($r_{S\,min}$, $M_{min}$, $T_S$)
QUANTUM STRING
EMISSION OF
MASSIVES STATES
BH
Γ spectrum
$E_i$ spectrum
STRING
REGIME
BH
$T_H$ ↑ increases
($r_S$ decreases)
BH
$p^+p^-$
$e^+e^-$
$T_H = \left(\frac{D-3}{r_S}\right), r_S$
SEMICLASSICAL
QFT REGIME
(HAWKING RADIATION)

# BLACK HOLE REFERENCES

M. Ramon Medrano, N.G. Sanchez, « Hawking Radiation in String Theory and the String Phase of Black Holes » Phys . Rev. D 61, 084030 (2000).

H.J. de Vega, N. G. Sanchez, « Decay rates of unstable particles and the extreme energie cosmic rays : top-down scenarios »
Phys Rev D67, 125019 (2003).

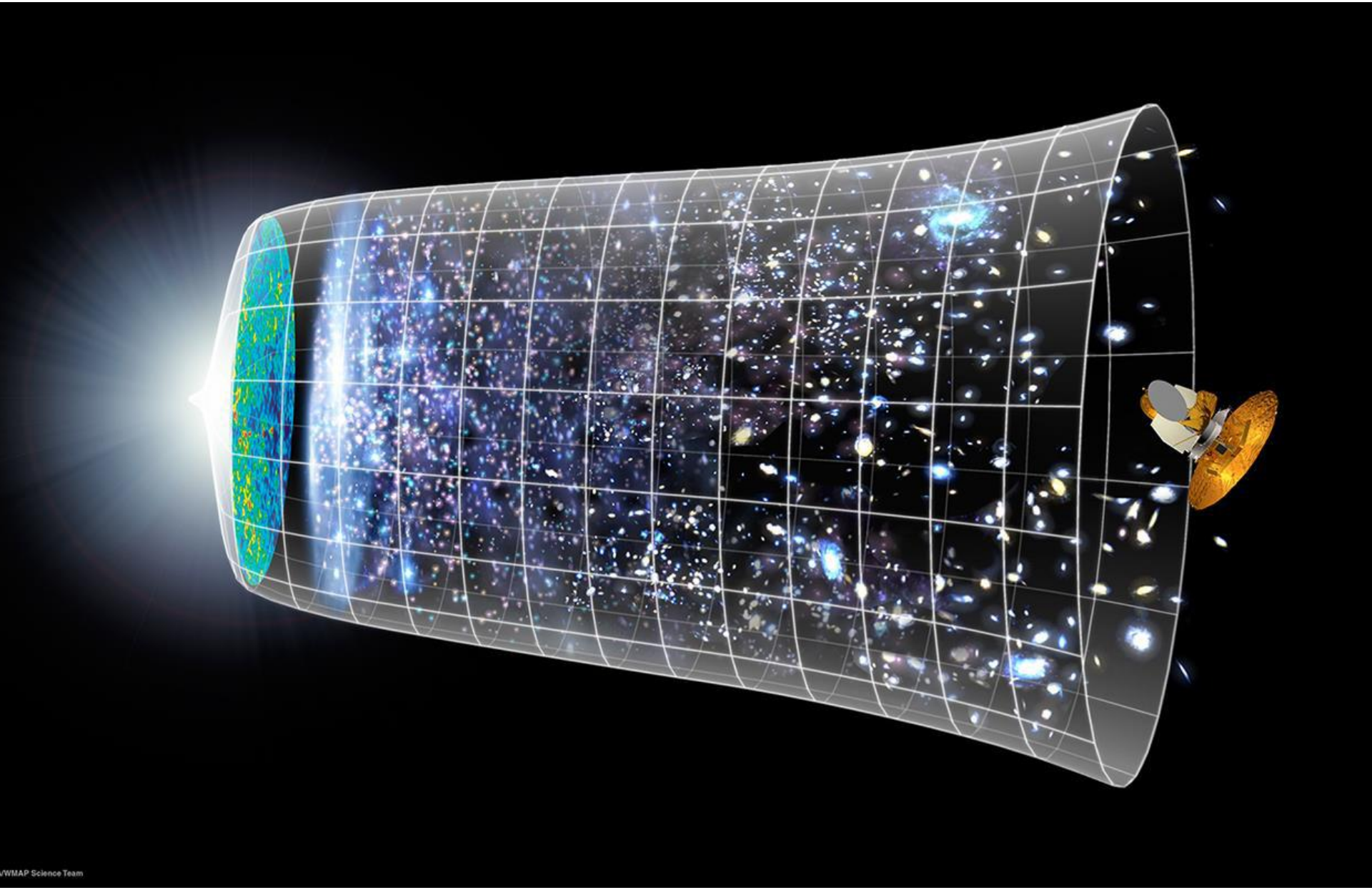
N. G. Sanchez « Conceptual unification of elementary particles, black holes, quantum de Sitter and Anti de Sitter string states »
Int. J. Mod. Phys. A 19, 4173, (2004).

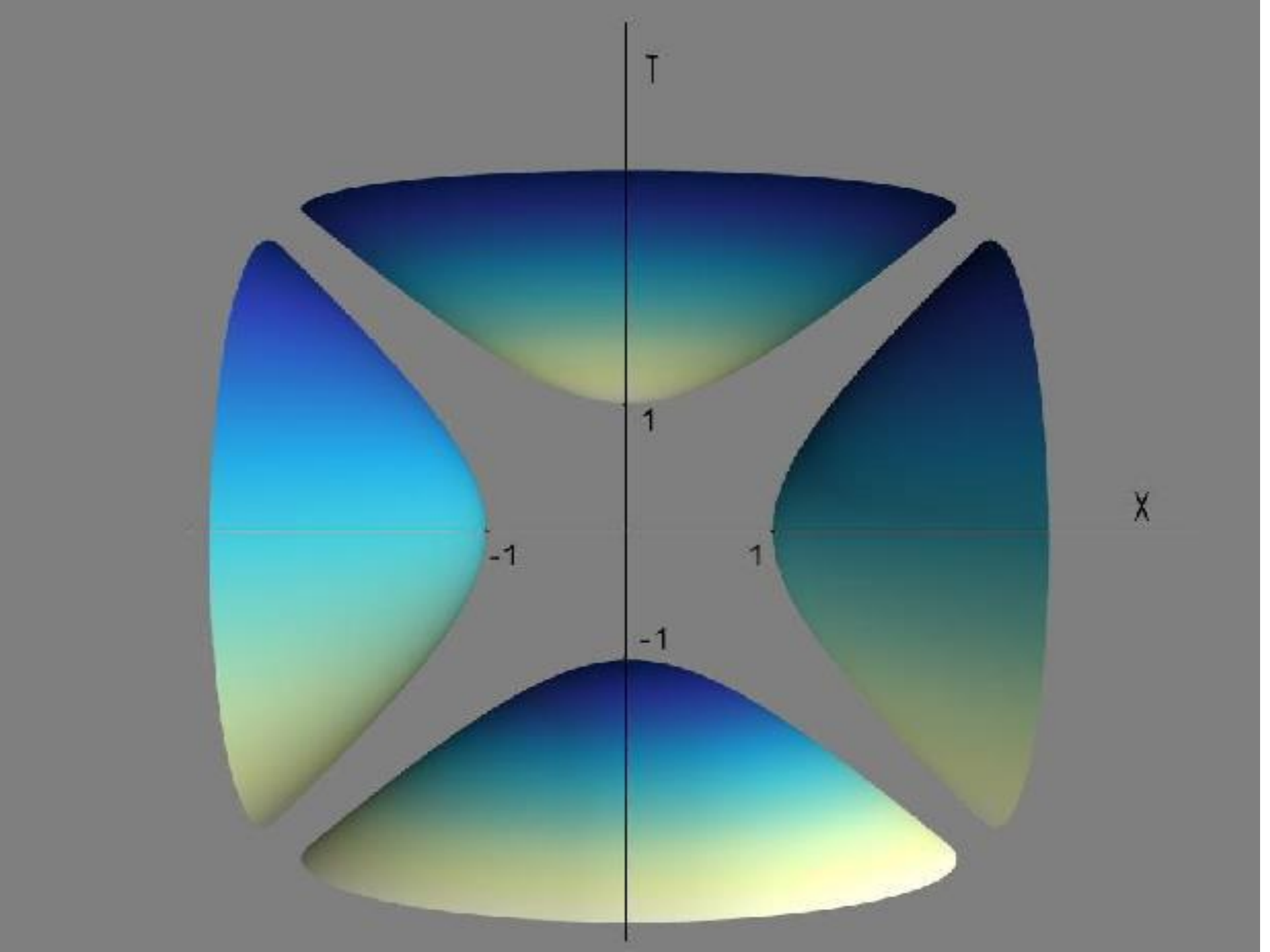
A.Bouchareb, M. Ramon Medrano, N.G. Sanchez,
"Semiclassical (QFT) and Quantum (String) Rotating Black Holes and their Evaporation: New results" Int. J. Mod. Phys. A 22, 1627 (2007)

D.J. Cirilo, N.G. Sanchez, "Microcanonical model for a gaz of evaporating black holes and strings, scattering amplitudes and mass spectrum",
Int.J.Mod.Phys.A23:975-1000,2008

**And recent work..... (without string theory) supported by this work**

**New perspectives from past work do appear .....**


/WMAP Science Team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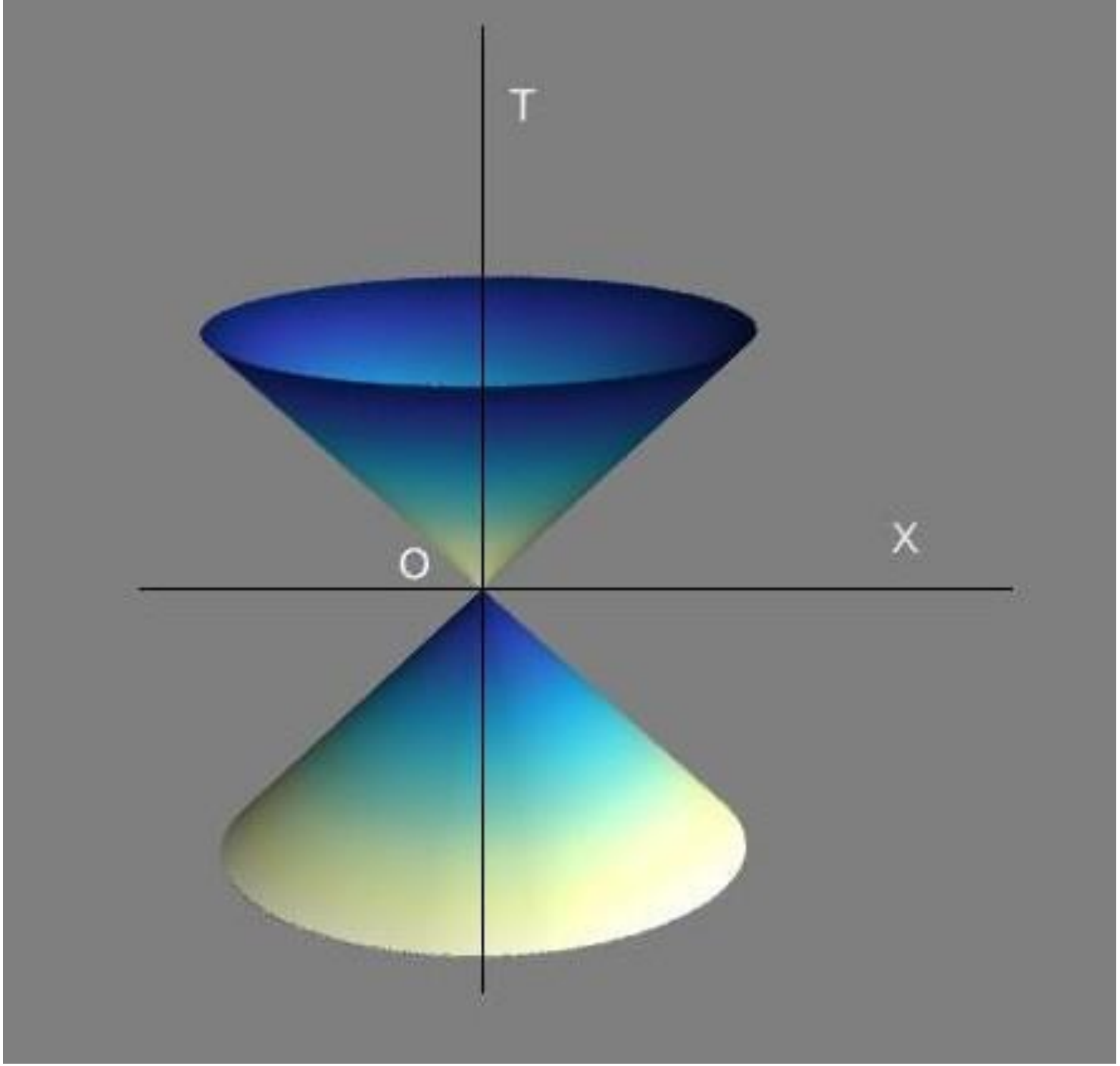
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# École Internationale Daniel Chalonge - Héctor de Vega

*27 YEARS of activity . Calling for understanding*

# PROGRAMME 2018

**LA SCIENCE QUI DONNE ENVIE. UNE GRANDE AVENTURE SCIENTIFIQUE ET HUMAINE**
**SCIENCE WITH GREAT INTELLECTUAL ENDEAVOUR AND A HUMAN FACE**

## Welcome to the Chalonge - de Vega School

### A Laboratory of Ideas. Research, Training, Scientific Culture

A beacon at the forefront of physical cosmology, international collaboration and careful interdisciplinarity, with both Theory and Observations

## LE NOUVEL UNIVERS - THE NEW UNIVERSE

29/03 -> Opening Session / Session ouverte « Nouveautés Cosmiques »
Cité Internationale Universitaire de Paris, Paris 14e.

26/04 -> Quantum physics in Galaxies, Stars, Dark Matter and Supermassive Black Holes. The New Synthesis.

29/05 -> Spring Open Session : Quo Vadis Science ? Ubi es Science?

28/06 -> Chalonge-deVega Turin Session 2018: « The New Universe »
Palazzo Lascaris, siège de la Région de Piemonte, Turin, Italy.

31/07 -> Quantum physics in Cosmology : Inflation, primordial gravitons, dark energy. The New Synthesis.

25/10 -> Les transformations actuelles de la Science: Technique, Technologie, fuite en avant, course aux financements... : Où est la Science ?

29/11 -> Concluding Session 2018 « Le Nouvel Univers » & Avant-Première 2019
Cité Internationale Universitaire de Paris, Maison de l'Argentine, Paris 14e.

Par I.-Bdd & J. Berthier

**https://chalonge-devega.fr/Programme2018.html**

**The Daniel Chalonge Medal and the Héctor de Vega Medal**

Subramanyan CHANDRASEKHAR (Nobel prize of physics)
Bruno PONTECORVO
George SMOOT (Nobel prize of physics)
Carlos FRENK
Anthony LASENBY
Bernard SADOULET (Fellow USA Acad. of Arts & Sciences)
Peter BIERMANN
John MATHER (Nobel prize of Physics)
Brian SCHMIDT (Nobel prize of Physics)
Gérad GILMORE (Fellow UK Royal Society)
Héctor J. DE VEGA

**TRIBUTE to Héctor de Vega, the Scientist and the Human person**

https://chalonge-devega.fr/HdeV.html

**School Courses, Lectures and Lecturers, Album of Pictures, Scientific Support and Archives Chalonge de Vega Sanchez :**

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Science Organizers
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Engineering Support
D. ZIDANI, F. SEVRE, E. VERGNAUD, J. BERTHIER, and other colleagues

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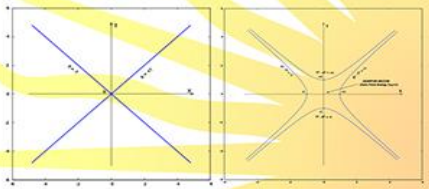
# 2018

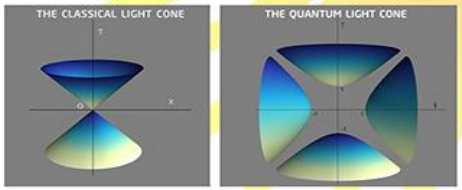
# LE NOUVEL UNIVERS - THE NEW UNIVERS
# THE TASK OF THINKING

## THE NEW QUANTUM STRUCTURE OF THE SPACE-TIME




## THE CLASSICAL-QUANTUM DUALITY OF THE SPACE-TIME


## A NEW QUANTUM UNIVERSE AT THE PLANCK SCALE

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Héctor J. DE VEGA
Nicholas KAISER
(Golden medal of the UK Royal Society)

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and other colleagues

Par J. Berthier & E. Vergnaud

**FIN…**

**THE END….**

**MUCHISIMAS GRACIAS**

**por vuestra ATENCION !!!**

**MERCI beaucoup pour votre ATTENTION !!**

**THANK YOU very much for your ATTENTION !!**