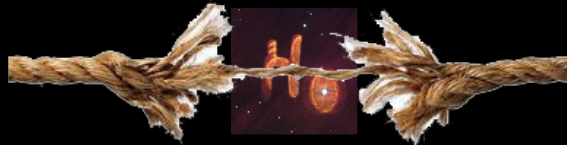


Hubble Tension workshop



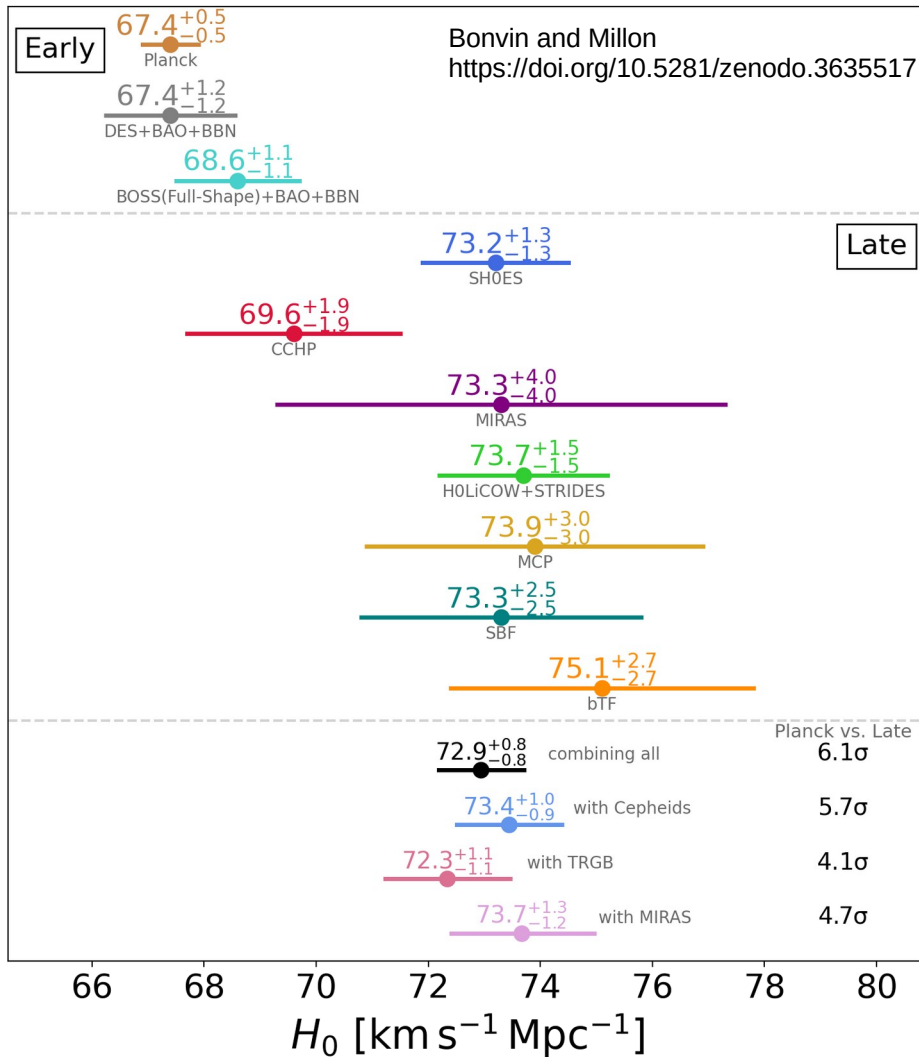
Credit: <https://adh0cc.github.io>

Welcome Address

Stéphane Blondin

Aix-Marseille Université
Excellent Cluster ORIGINS visitor

flat – Λ CDM



Hubble Tension

H_0 : key cosmological parameter
(physical density $\sim \Omega_x h^2$)

Tension at the 4-6 σ level !

H_0 @ ORIGINS

Project	Probe	People
LACES	Cepheids + <i>supernovae</i>	Romaniello, Kudritzki
FGLR	Blue supergiants + <i>Cepheids</i>	Kudritzki, Weller, Weiss
adH0cc	<i>Supernovae</i>	Hillebrandt, Leibundgut, Csörnyei, Cudmani, Holas, Flörs, Kressierer, Spyromilio, Suyu, Taubenberger, Vogl, <i>Blondin</i> ^(*)
H0LiCOW	Lensed quasars	Suyu, Hilbert, Komatsu, Taubenberger, Yıldırım
HOLISMOKES	Lensed <i>supernovae</i>	Suyu, Bayer, Cañameras, Huber, Nöbauer, Schuldt, Shu, Taubenberger, Vogl, Yıldırım

Numerous projects, probes, people... possibilities for ***synergies!***

^(*)ORIGINS Cluster visitor (March-May 2021)

Danke sehr!

- **Funding:** Excellence Cluster ORIGINS (Seed Money Project)
- **Host:** Munich Institute for Astro- and Particle Physics (MIAPP)
- **SOC:** Sherry Suyu (MPA/TUM), Wolfgang Hillebrandt (MPA), Bruno Leibundgut (ESO), Stéphane Blondin (ORIGINS visitor)
- **LOC:** Alice Smith-Gicklhorn, Sofie Kronseder, Sandra Schmid (ORIGINS/MIAPP)
- **You!** 96 registered participants (28 on-site, 68 remote)

General Information

- **Code of conduct:** <https://www.munich-iapp.de/code-of-conduct>
- **Hybrid on-site/remote:** let's be on time!
- **On-site participants:** “3G” rule, wear masks (also during Q&A, but not during coffee breaks!), lunch, visitor offices
- **Remote participants:** <https://tum-conf.zoom.us/j/61103186344> (passcode: 024540) – left open during breaks
 - Use your **full name** (+pronouns)
 - Check you are **always on mute**
 - **“raise hand”** function during Q&A or Zoom chat window

Programme

- <https://indico.ph.tum.de/event/6895/timetable/>
- **Monday:** Overview and H_0 from supernovae
- **Tuesday:** H_0 from CMB and Lensing
- **Wednesday:** Blue supergiants & Cepheids as distance indicators
- **Thursday:** TRGB distances and Megamasers
- **Friday:** Standard sirens and the Inverse distance ladder

Programme

- <https://indico.ph.tum.de/event/6895/timetable/>
- **2 talks per day:** 9:15-10:30am and 11:00-12:15am^(*)
(*)except on Thursday 30.09: 15:00-16:15
 - **45 min (talk) + 30 min (Q&A)**
- **Coffee breaks:** 10:30-10:55am
- **Social dinner:** Thursday at 19:00 in Garching

Let's get started!

- <https://indico.ph.tum.de/event/6895/timetable/>

Monday Sep 27th: Overview and H_0 from supernovae

9:00-9:15

Welcome address

speaker: Stéphane Blondin (Aix-Marseille Université) **IN-PERSON**

9:15-10:30

General overview of the H_0 tension problem

speaker: Licia Verde (University of Barcelona) **REMOTE**

11:00-12:15

H_0 from direct distances to core-collapse supernovae (adH0cc project)

speaker: Christian Vogl (MPA) **IN-PERSON**