

EHT status

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&

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and more

In collaboration with the international EHT team

Resolving the event horizons of BHs

- AGN core is most-likely a super-massive black hole.
- Yet, there is no confirmation of existence of event horizon



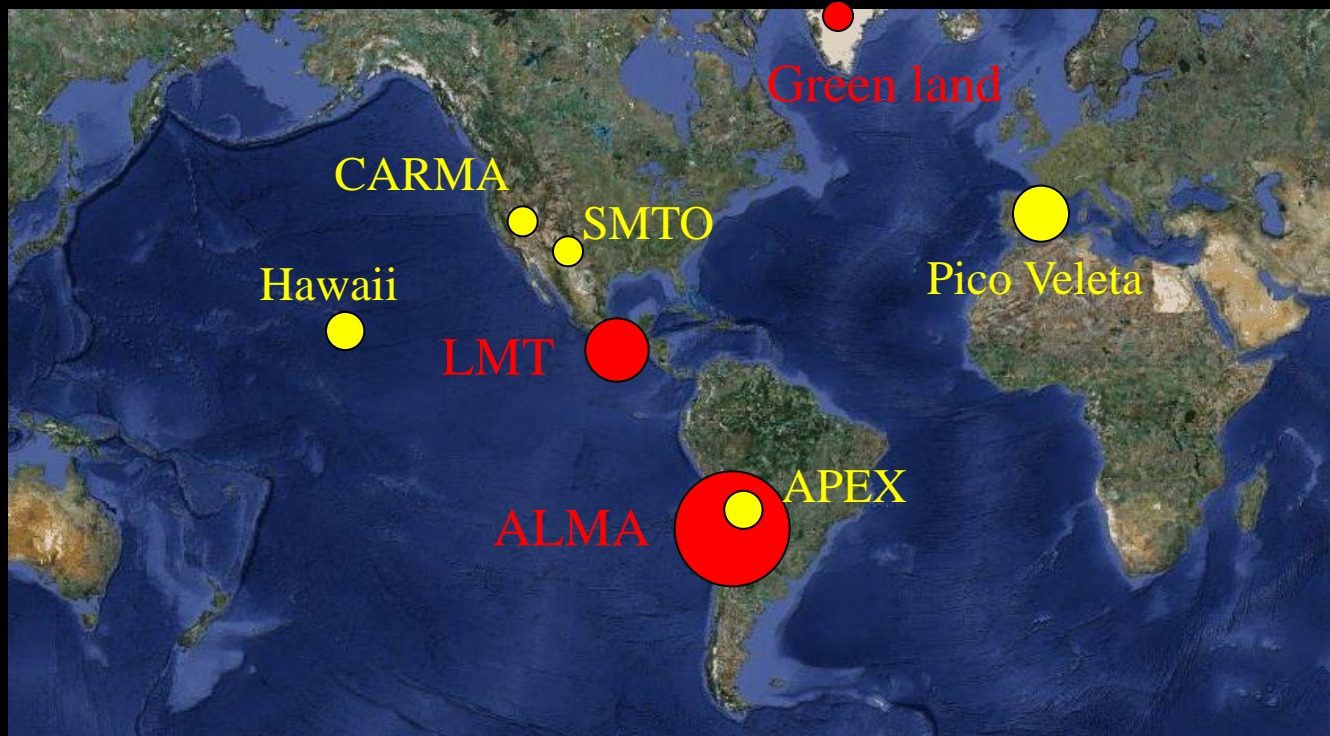
Fukue et al 1989

Direct detection of BH shadow is an ultimate confirmation of existence of BH. (or negative results may indicate an existence of naked singularity !?)

- New breakthrough for experimental BH physics!?

EHT (Event Horizon Telescope)

(sub)mm VLBI array to resolve BH images



● South pole telescope

Global collaboration in VLBI

US, Canada, Mexico, Chile, Japan, Taiwan, Germany, Netherland, and more

APP (ALMA Phase-up Project)

International collaboration
for ALMA up-grade



- ALMA board acceptance in 2012
- APP CDR (Critical Design Review) held in 2013
- APP test observations in 2014/15
- Open use in 2016 ? (Cycle-4 ?)

ALMA VLBI era is coming soon

We need to get prepared for the era for sub-mm VLBI with ALMA



APP work by Japan

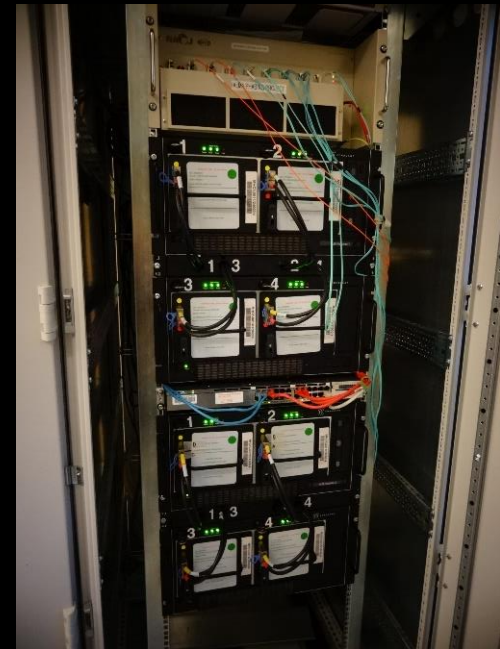
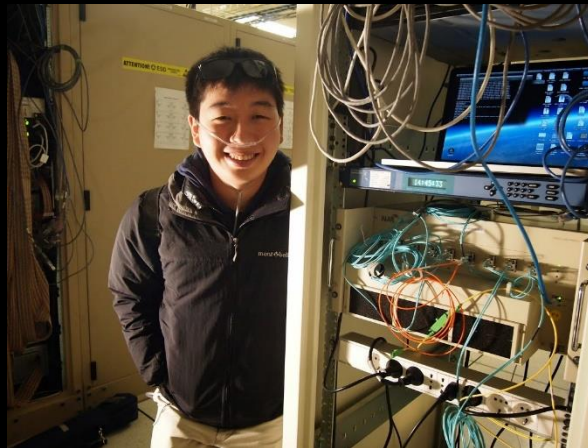
- contribution to APP: optical fiber link (AOS-OSF)

data transmission between ALMA site (5000m) and OSF (2900m) through one fiber

8 x 8 Gbps DWDM modules

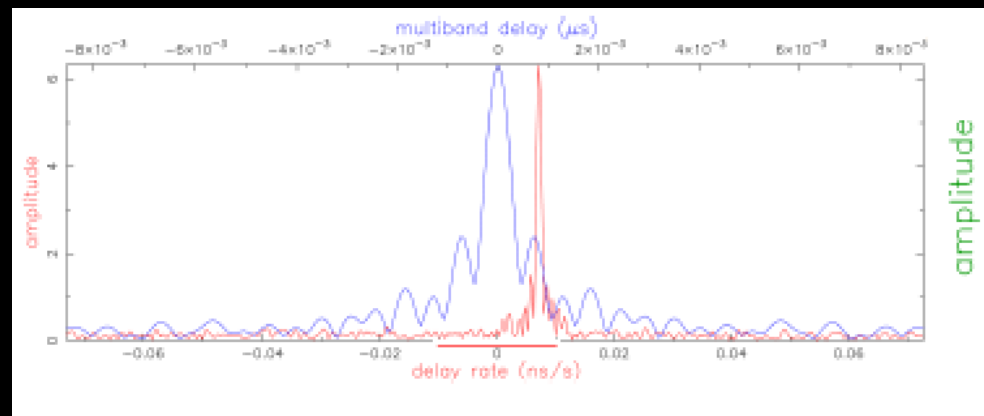
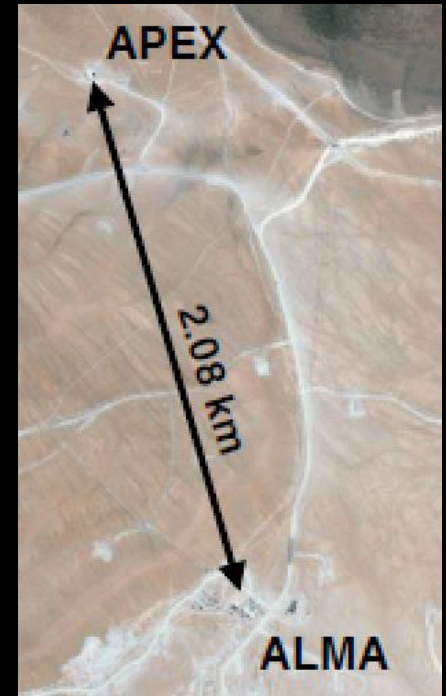
installed in June 2014

working now



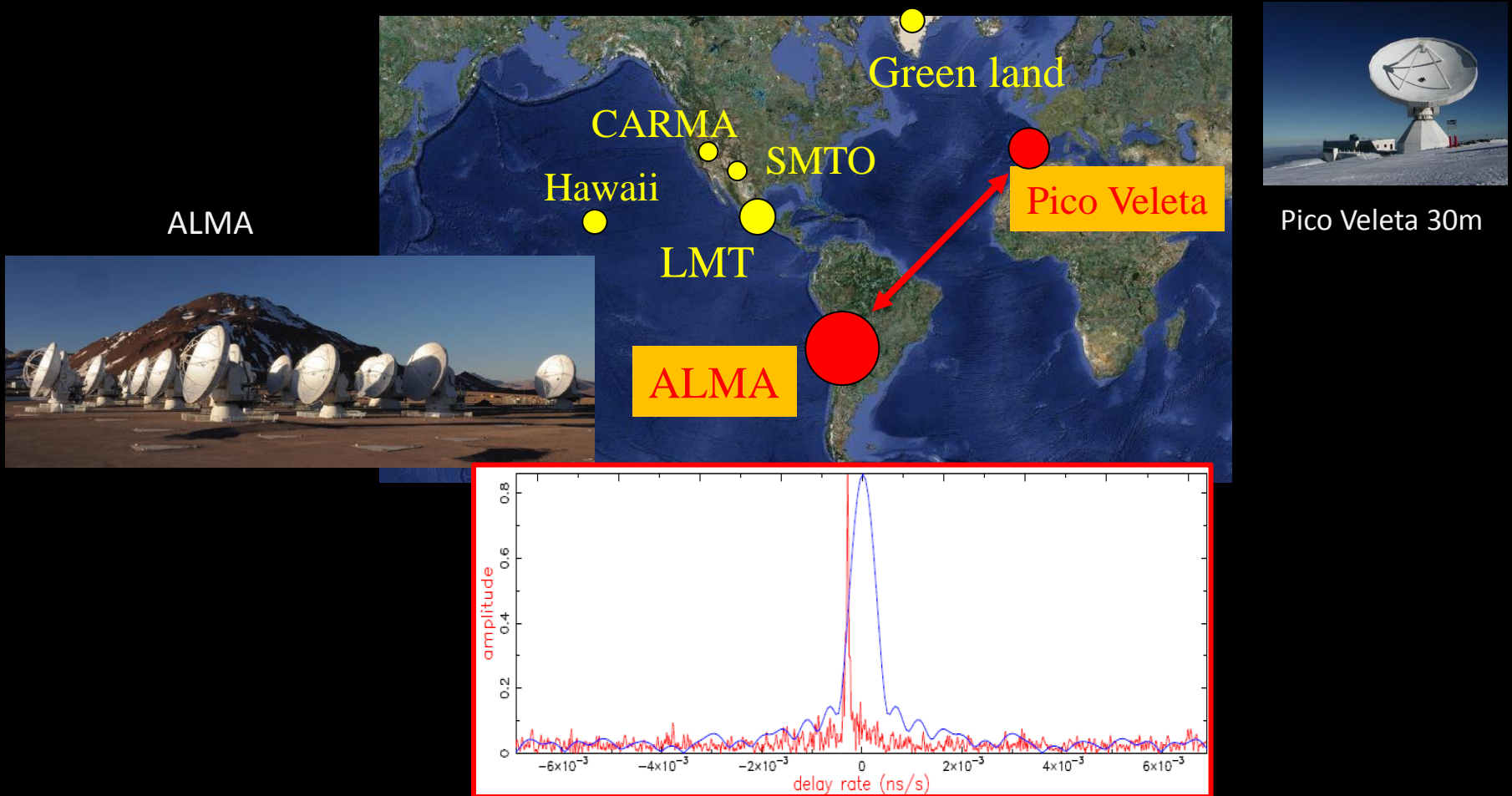
APP First Fringe detection

- 13 Jan 2015
- Short-baseline experiments with APEX
- Full VLBI mode (Independent maser, recorder)
- Fringe detected for 0522-0364 (bright calibrator)



Inter-continental fringe detection

Fringe detection at 1.3mm between ALMA and IRAM 30m



ALMA—Pico Veleta fringe on 29 Mar 2015

Future prospect for open use

- VLBI with ALMA: to be opened in Cycle-4

but how ?

- Band-3 (86G): under the framework of GMVA?
- Band-6 (230G): still unclear (could be delayed?)