Construction and Commissioning of the Large Size Telescope in La Palma





Outline of the talk



- LST1 sub-consortium
- Location
- Construction
- Inauguration
- Commissioning
- Next steps



Picture from LST meeting, 2017 **LST sub-consortium** United States More Cou FTE in FTE LST People People in CTA in LST СТА total Country 87,12 221 26 Germany (MPI only) 7,3 61 11,75 133 44,60 Japan 89 35 Spain 35,00 16,4 Italy 240 35 93,19 9,6 207 17 75,53 7,1 France 30 10,15 Brazil 4 0,9 Ś 10 2,50 1,5 Croatia 5 Em Sweden 19 4,45 0,5 Sweden 1 Poland Germany TOTAL 949,00 184,00 352,54 55,05 ZOOM MODE France Croatia -Spain Japan India **Mission 1:** Four LSTs at CTA-N Brazil **Mission 2:** Four LSTs at CTA-S

CTA North in La Palma





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cherenkov

telescope array

D. Mazin, LST Project Manager

-CTA-N photomontage

LST-Organigram





Focal Plane Instr. Electronics (JP/IT/ES) Camera body (ES)

Camera Supporting Structure (FR/IT)

Flywheel, UPS (JP) Computers, network (JP)



LST Project : Big International Effort BR(Brazil), CH(Switzerland), DE(Germany), ES(Spain), FR(France), IN(India), IT(Italy), HR(Croatia), JP(Japan), SE(Sweden)

> LST sub-consortium: 10 countries 195 members 55 FTEs

Mirror (JP) Interface Plate(DE/BR/JP) Actuator (JP/CH) CMOS-Cam (JP)

Star Guider (SE) Calibration Box (IN/IT)

Structure (DE) Access Tower (DE/ES)

Drive (DE/FR/ES) Bogie (DE/ES/IT) Rail (DE/ES) Foundation (ES)

D. Mazin, August 2018, ICRR, University of Tokyo

Schedule LST1

Installation: 15 months

First Stone: 9 Oct 2015 Breaking Ground: July 2016



D. Mazin, ICRR, University of Tokyo





Construction: Civil Works





LST Mechanics: Lower Structure + Dish



MPP+MERO TSK



D. Mazin, August 2018, ICRR, University of Tokyo

Construction: Mechanics





Construction sequence





Construction: Optics





April 26

April 28

May 4

May 10

May 15



May 23



dates in 2018

Construction: Camera





Construction: UPS/FlyWheels



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cherenkov

telescope array





3 PB disk, 2000 cores, sufficient for threshold scenario in CTAN: 4LST + 5MST

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Provided by the U Tokyo

LST1 inauguration Oct 10, 2018





Commissioning: Safety





Status Camera



- All modules operational and performing OK
- Calibration of the trigger settings ongoing
- Data taking up to 18kHz (spec 15kHz), fine tuning ongoing
- Cosmic ray data taking starting





Status Mirrors and Drive

- **Mirrors** OK, 1 exchanged so far due to a problem at the fixed point
- Actuators: 11 (out of 396) were stuck, now exchanged and sent to Zurich for check
- **Drive** pointing works fine, acceleration and power consumption within specs
- Drive tracking is work in progress

Polaris image on the camera shutter





cherenkov

telescope





Work in progress...

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CTA-N phase 1: 2019-2022





Schedule LST2-4



Conclusion



- LST1 constructed in 15 months
- Important mile stones of the CTA North achieved
- Commissioning of the LST1 is going well
- Ready to construct LST2-4 in CTA-N until 2022

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Construction: Mechanics





Conclusion



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- Important mile stones of the CTA North achieved
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