

Cosylab Switzerland and SKA

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About Cosylab

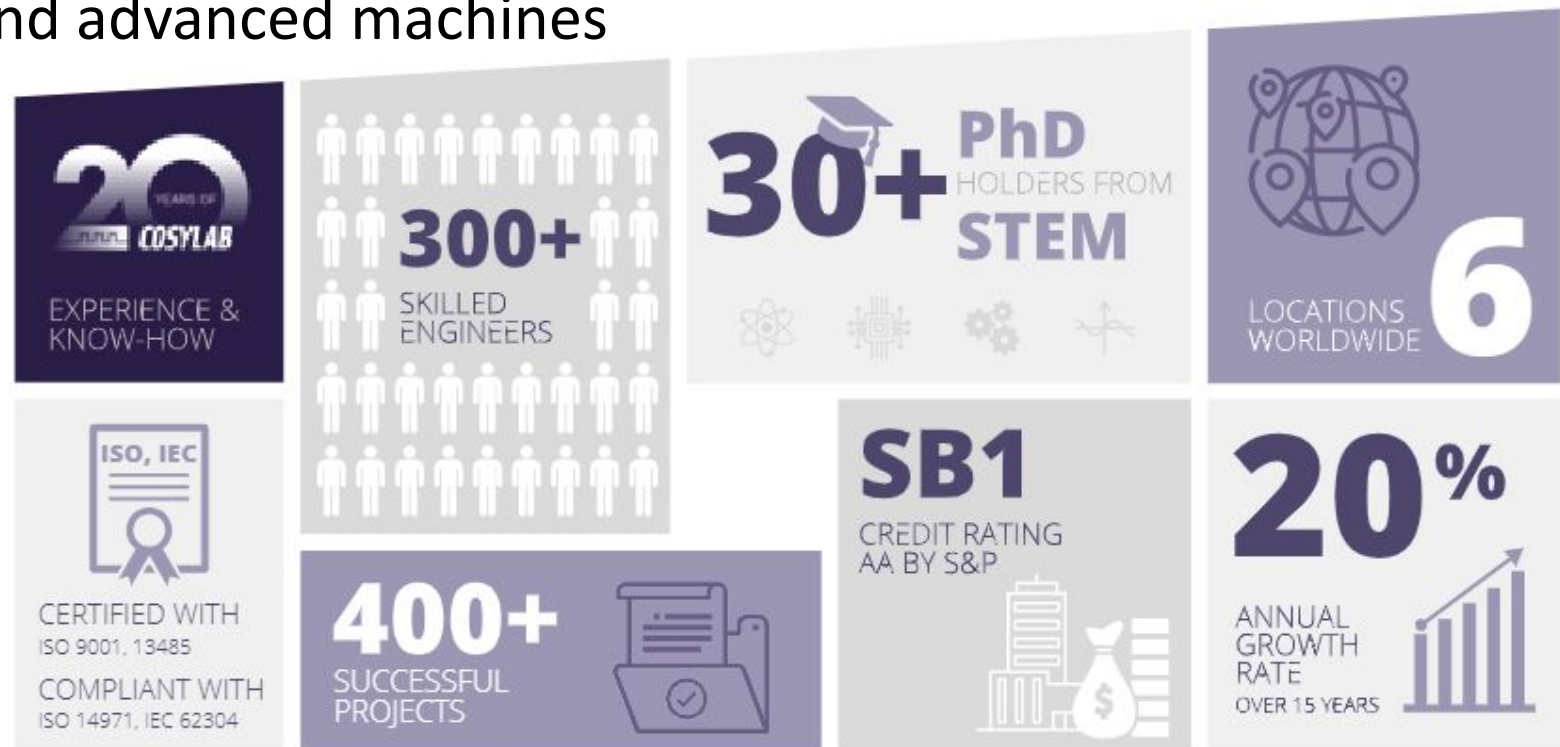


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Cosylab in short



- ❑ Founded in 2001
- ❑ HQ in Slovenia with branches and teams in **Switzerland**, USA, China, Japan, Sweden, South Korea, Ukraine
- ❑ Innovator and global leader in software for the world's most complex, precise and advanced machines
 - Particle accelerators
 - Nuclear fusion
 - Radio telescopes
 - Atomic force microscopes
 - ...



Cosylab

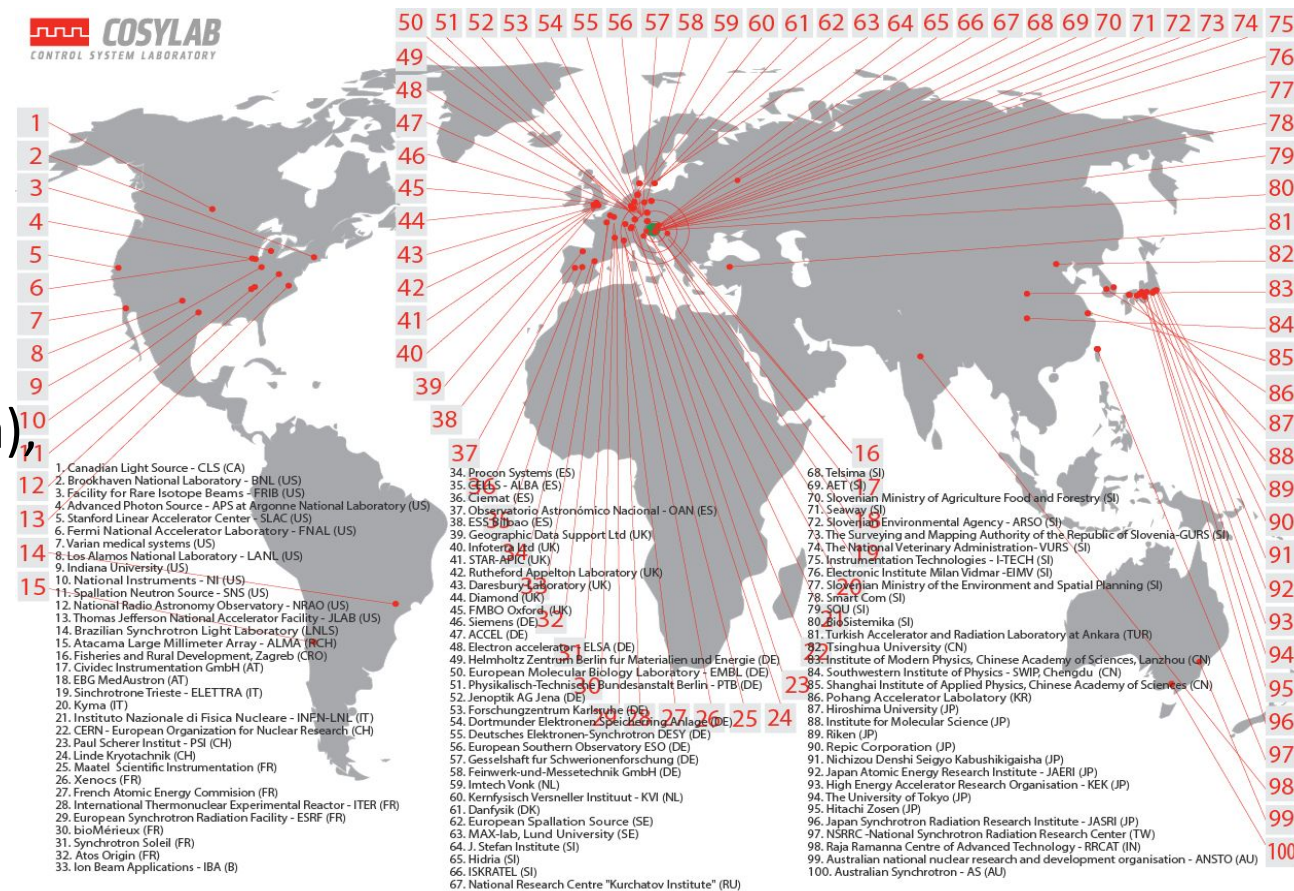


World leader in **System Integration and Software** for particle accelerators for research and cancer therapy

- 43% market share

Selected references:

- Accelerators:** FAIR (Darmstadt), LHC, White Rabbit (CERN), SwissFEL (PSI), LCLS/LCLS-II (SLAC)
- Neutron sources:** SNS (Oak Ridge), ESS (Lund)
- Cancer therapy:** MedAustron (Austria), HIMM (Lanzhou, China), MGH (USA)
- Astronomy & Astrophysics:** ALMA (Munich, Atacama Desert), ESO E-ELT (Cerro Amozones), CTA (Cherenkov Telescope Array)
- Fusion:** ITER (Cadarache)



- ❑ Founded in 2014
- ❑ Staff: 12 experts
 - 1 computer scientist
 - 6 engineers (2 PhD)
 - 1 mathematician
 - 3 physicists (1 PhD)
 - 1 lawyer
- ❑ Sites:
 - Technopark Aargau, Brugg (main office)
 - Meyrin (Geneva)
- ❑ Projects and domain knowledge:
 - SKA
 - SwissFEL, SLS, PANDA at PSI
 - Proton therapy for cancer treatment
 - QualySense, industrial automation
 - Quantum
- ❑ Focus:
 - Control systems
 - Integration & synchronization of heterogeneous devices
 - Fast real-time control, synchronization
 - SW engineering

Cosylab at SKA



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Cosylab at SKA



- Timeline

- Bridging phase

- 2 FTEs funded by EPFL
 - From June 2021 to March 2022

- Framework agreement with SKAO

- May 1st 2022 - July 31st 2029
 - Cosylab now an official software supplier of SKAO

EPFL

- Team

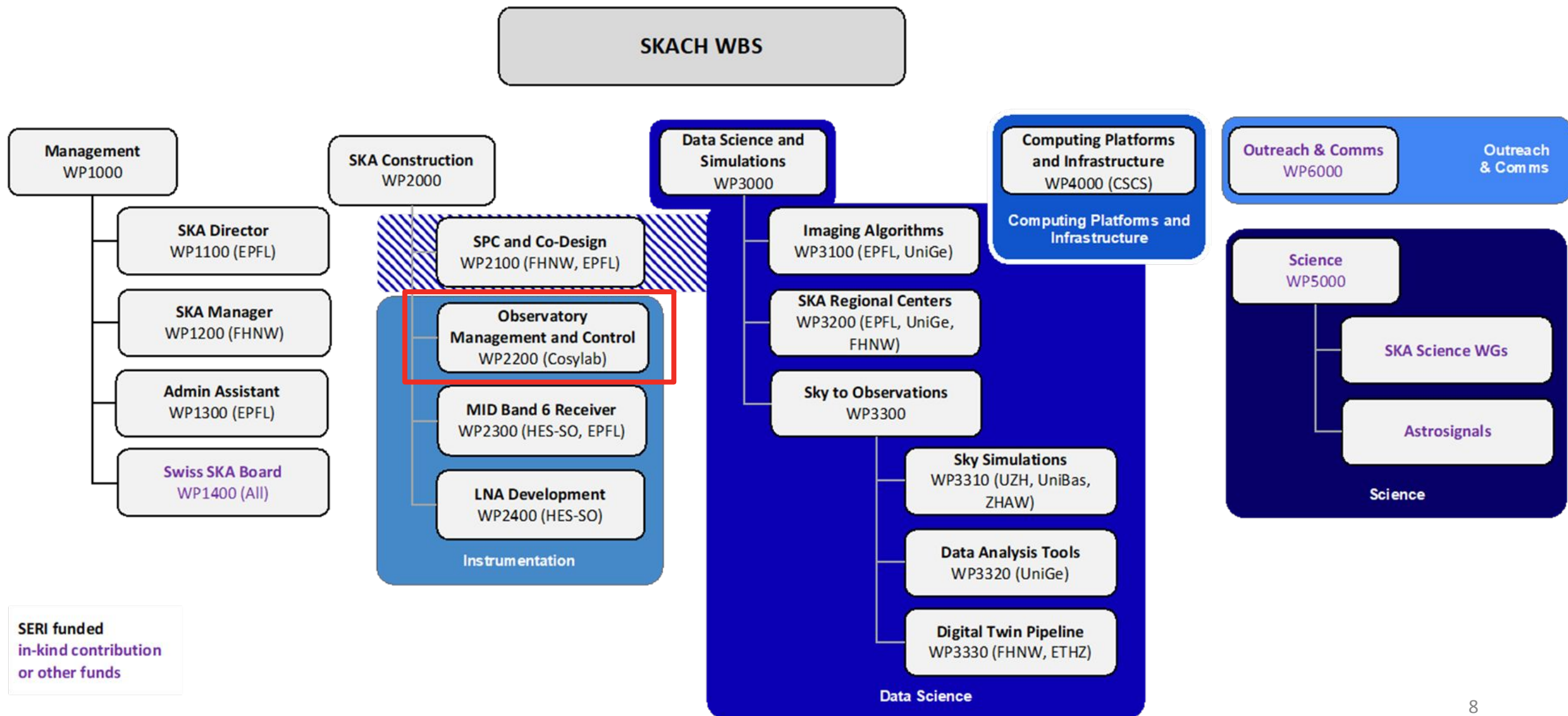
- Alexander Söderqvist

- M.Sc. Electrical Eng, Embedded systems
 - 9 years exp. in control systems

- Ivana Novak

- M.Sc. Physics, Astronomy
 - 6 years exp. in control systems

Observation Management and Control



SERI funded
in-kind contribution
or other funds

Cream Team



- ❑ Lead by INAF in Italy (Florence Arcetri Observatory)
- ❑ Team Members
 - 5 Italian, 1 Portugal, 1 India, 2 Switzerland
- ❑ Focus on
 - Central Signal Processor Local Monitoring and Control (CSP.LMC)
 - Taranta: tool for creating web-based engineering UIs
- ❑ Part of Observation Management and Control (OMC)
- ❑ Scaled Agile Framework (SAFe) practices
 - Planning is done on quarterly basis
 - Business value assigned to features
 - Teams pull features

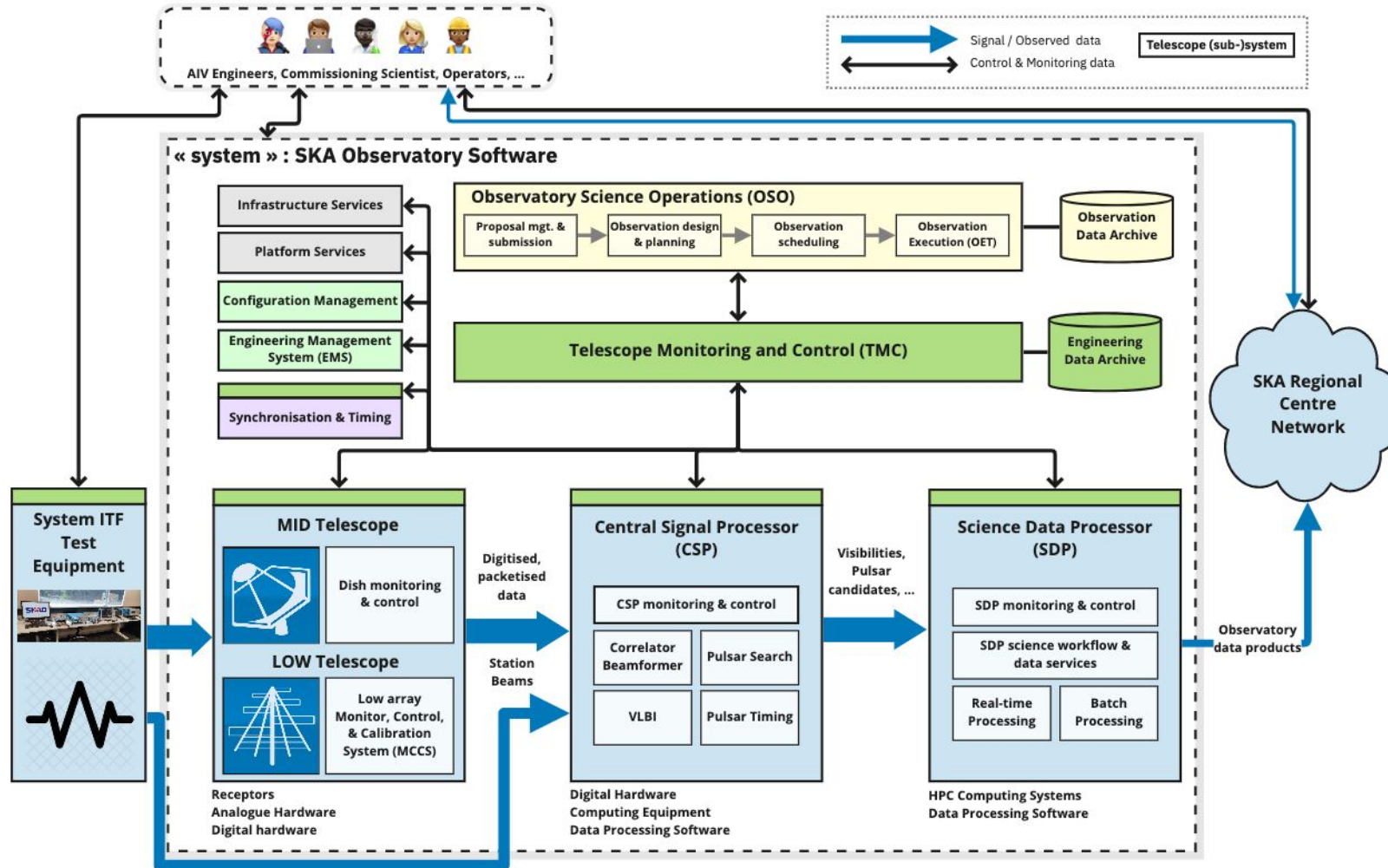


Contribution to SKA



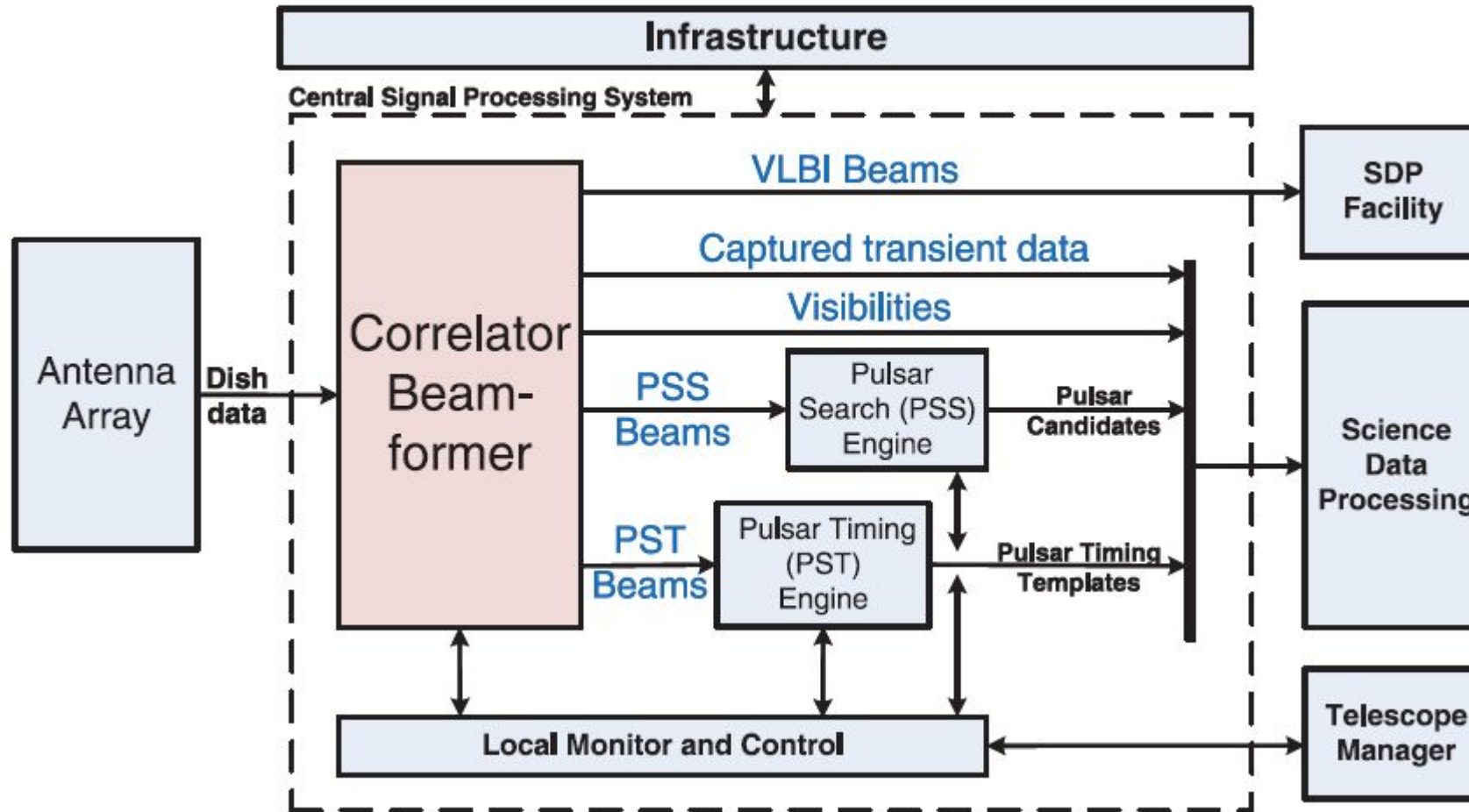
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SKA Software Components



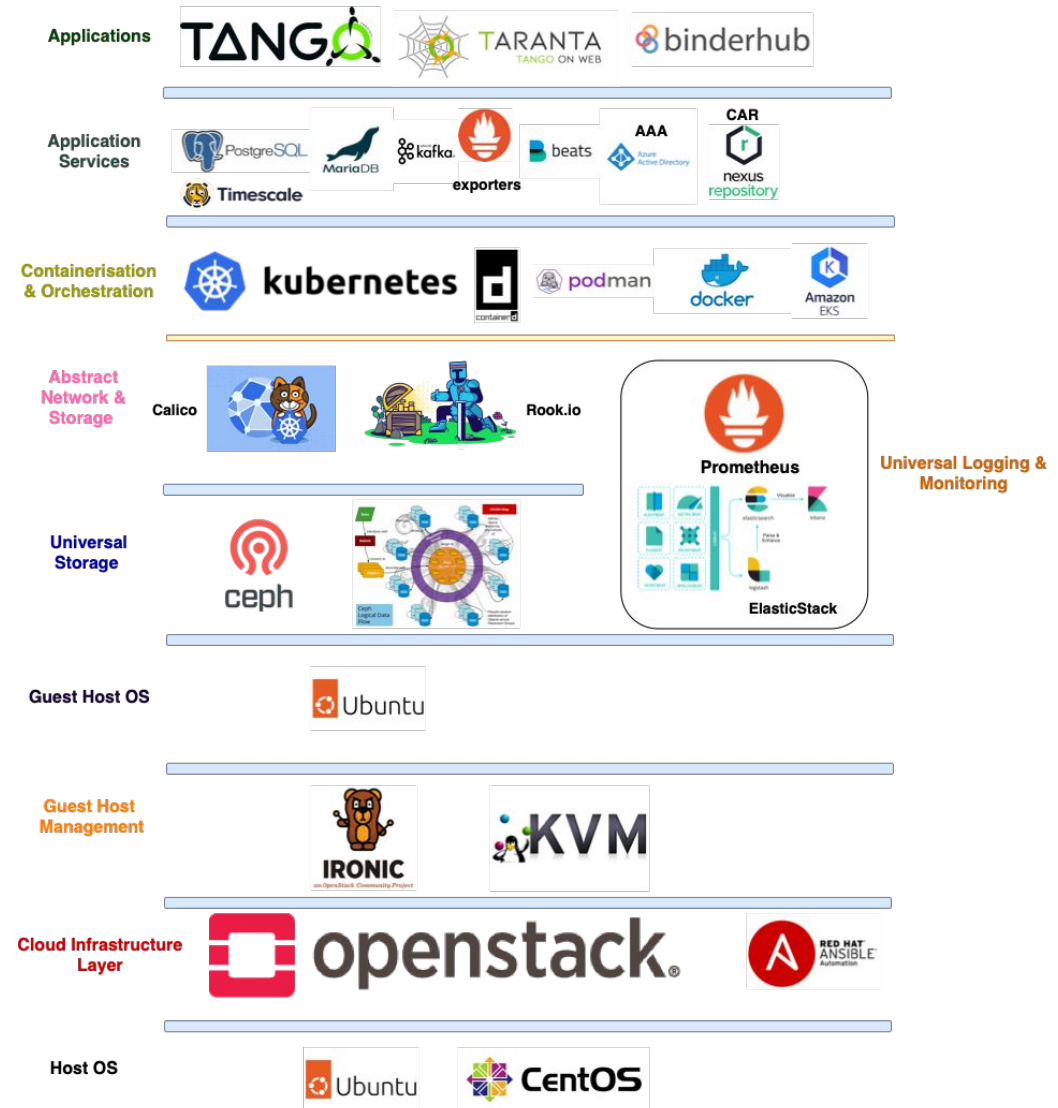
Courtesy of Marco Bartolini

Central Signal Processor



Technologies

- Tango
- Python
- Taranta
- Kubernetes
- Docker/Podman
- Ubuntu/Linux
- Gitlab
- ...



CSP.LMC work

- ❑ Mature software design
- ❑ Improved robustness and reliability
 - Error handling and reporting
 - Logging
- ❑ Testing improvements
 - Simulators for subsystems
 - Article for ADASS in preparation
- ❑ Integration into SKAMPI
- ❑ System tests at PSI facility
 - collaboration with NL team
- ❑ Capabilities

29 August 2022

Software design for CSP.LMC in SKA

G. Marotta, E. Giani, I. Novak, A. Söderqvist, C. Baffa

Author Affiliations -

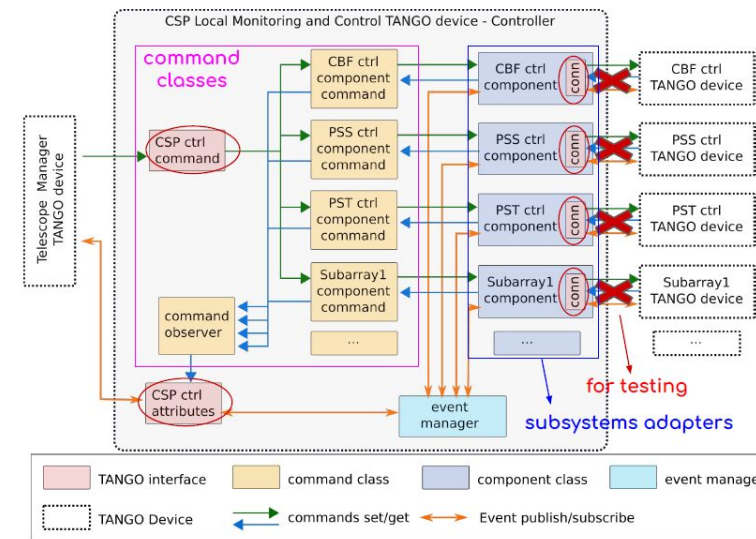
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[SPIE article](#)



Central
Signal
Processor
Local
Monitoring and
Control

SKA
MVP
Prototype
Integration

Prototype
System
Integration

THANK YOU!

Cosylab Switzerland GmbH

Web: www.cosylab.com

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