

**toward the HIRES phase-B kick-off**  
**the instrument scientist perspective**

**Livia Origlia - HIRES Project Office Instrument Scientist**  
*[livia.origlia@inaf.it](mailto:livia.origlia@inaf.it)*

*January 2022, HIRES online progress meeting*

## activities foreseen in phase B

### ➤ IS team consolidation & organization

Livia Origlia - PO *livia.origlia@inaf.it*

Michael Weber - UBV *mweber@aip.de*

Christhope Lovis - RIZ *christophe.lovis@unige.ch*

Oscar Gonzalez - YJH *oscar.gonzalez@stfc.ac.uk*

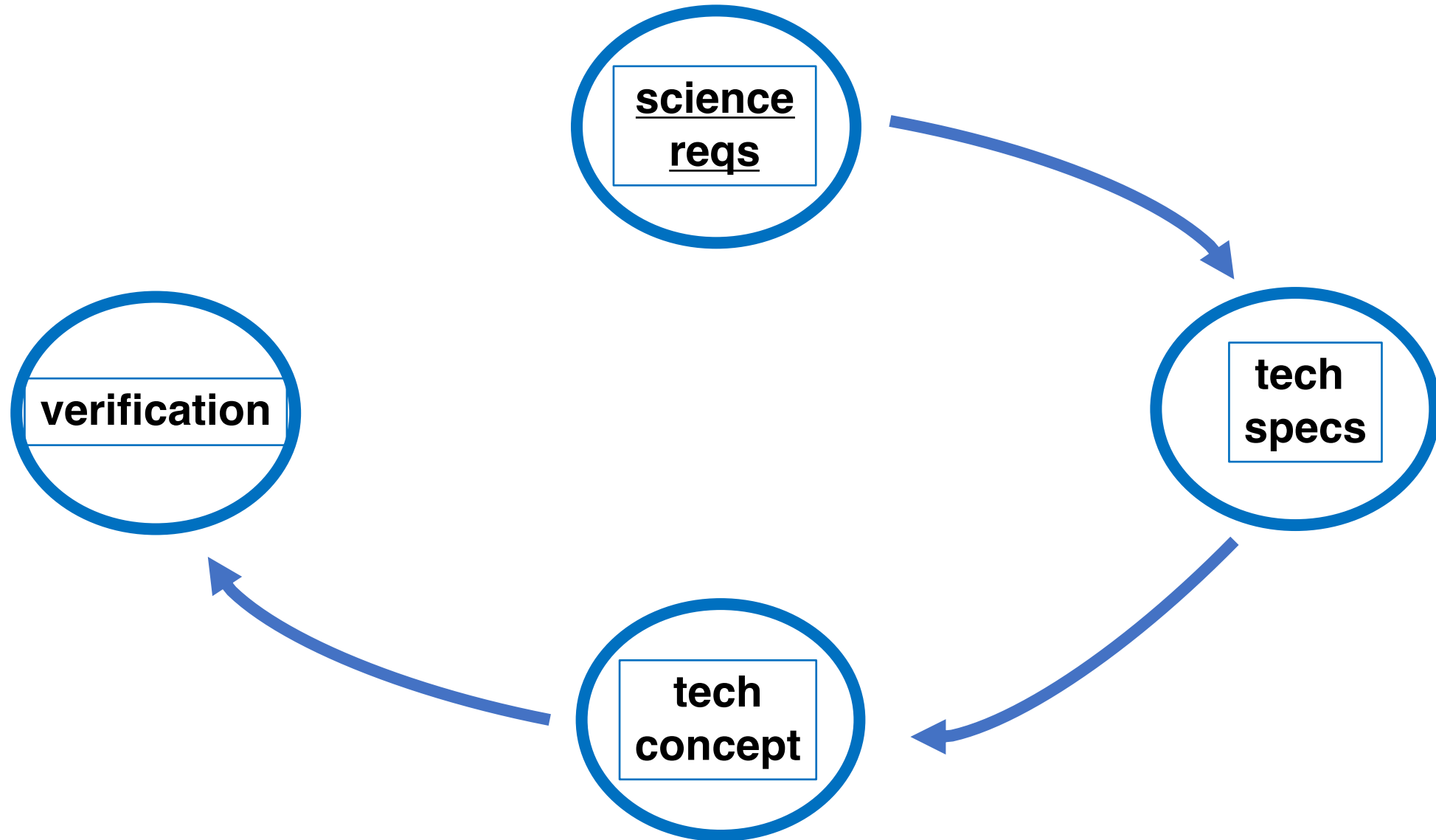
+ Elena Mason - SW *elena.mason@inaf.it*

+ *other specialists TBD*

periodic (TBD) telecons & progress reports to plan and monitor activities

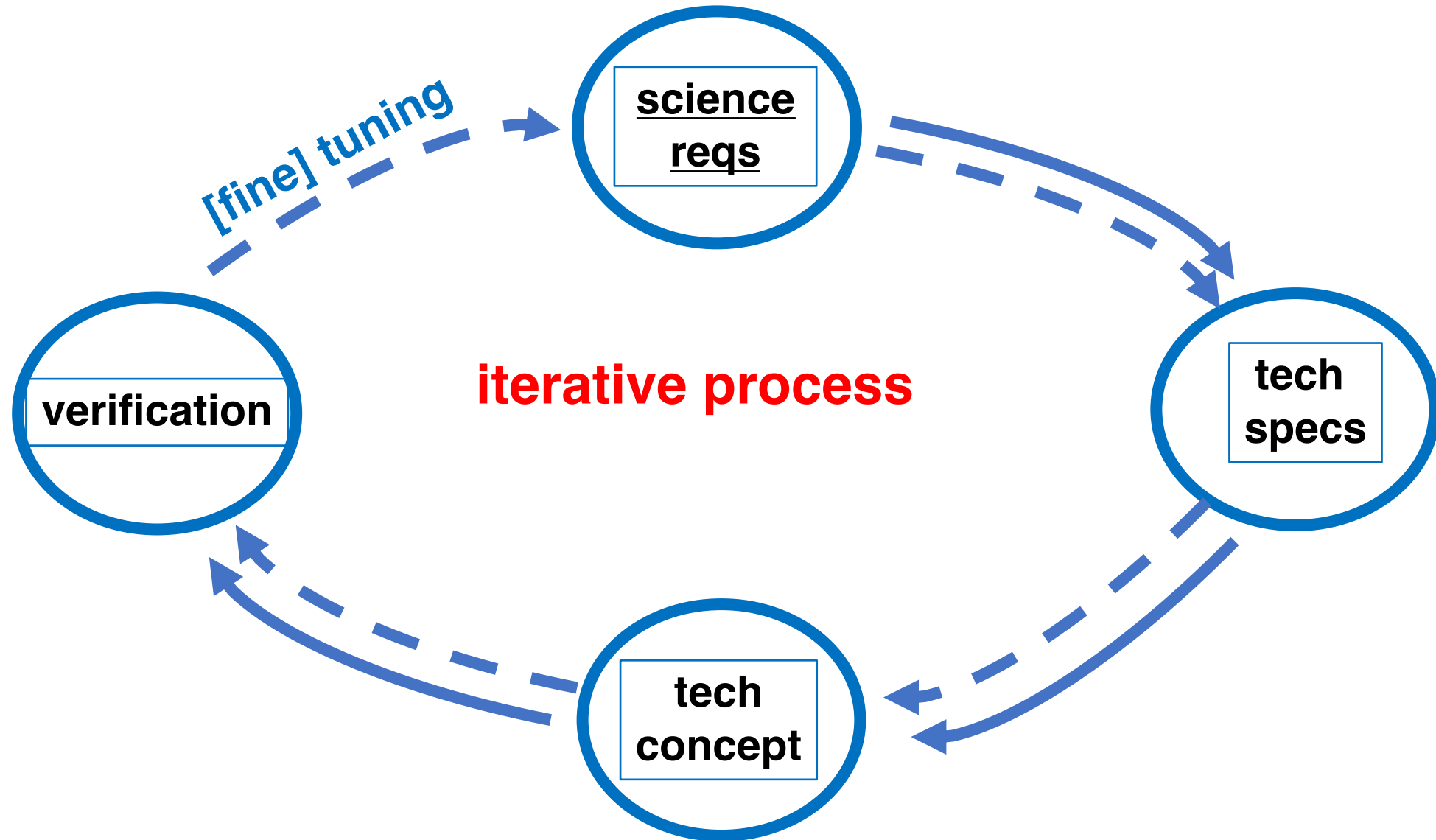
# activities foreseen in phase B

## ➤ preliminary design phase



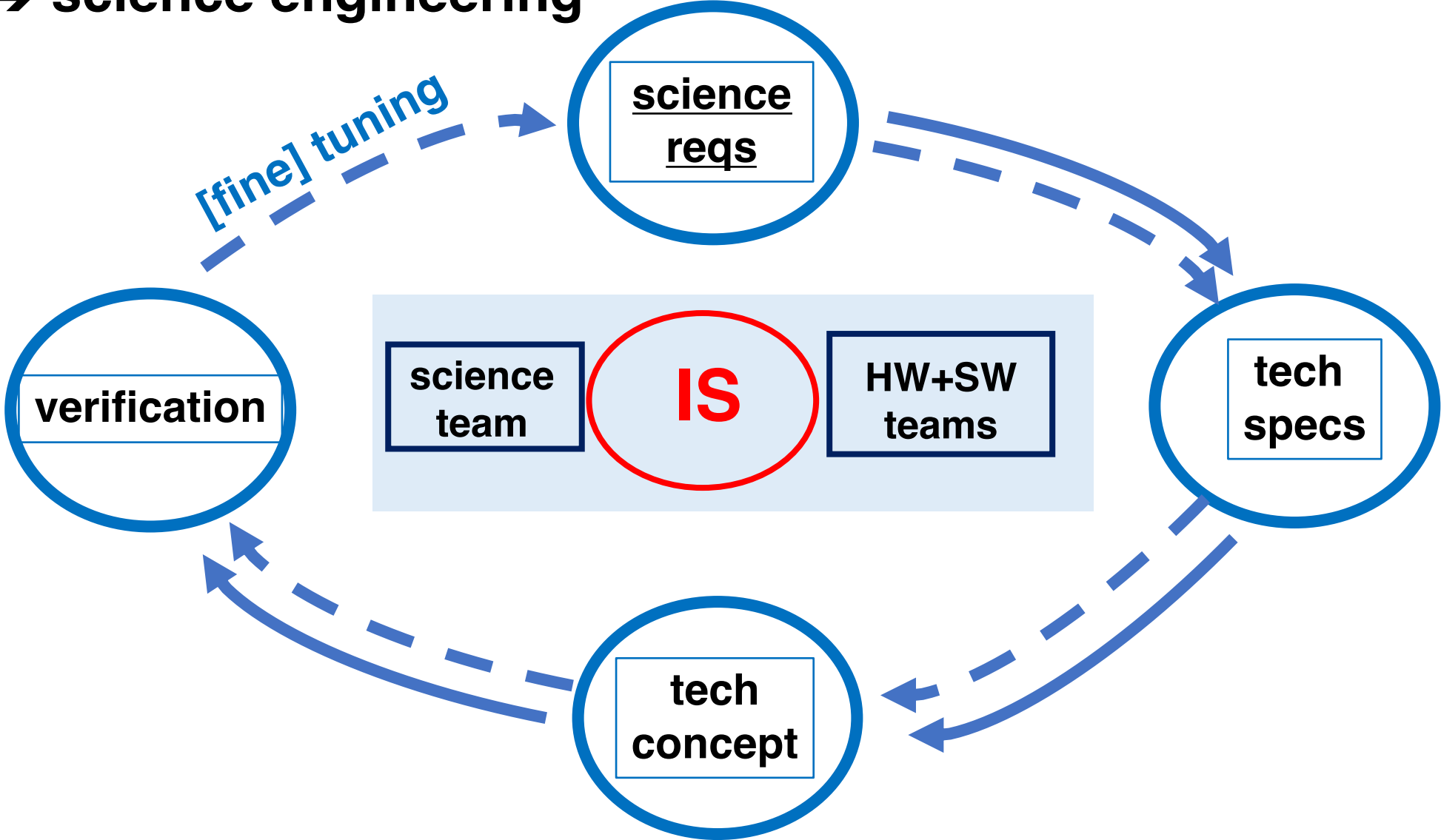
# activities foreseen in phase B

- preliminary design phase



# activities foreseen in phase B

- **IS** → interface between science & technical teams
- science engineering



# activities foreseen in phase B

## ➤ **IS** → interface between science & technical teams → science engineering

- ✓ identification of contact/reference person(s) within each sub-system team
- ✓ maintaining an iterative communication to identify
  - parameters that are complex/critical in terms of definition and reciprocal (science vs tech teams) comprehension
  - arguments that occasionally lead to some misunderstanding
  - state-of-the art consensus and open issues
- ✓ promoting confrontation
  - with existing references/expertise/knowledge → to set current science & tech context/boundaries
  - with other ESO/ELT projects/consortia → to benefit from lesson learned

# activities foreseen in phase B

## ➤ **HIRES science operations & calibration**

starting from the TechSpec document

- definition of observing modes (preliminary)
- definition of the calibration references and procedures (preliminary)
- definition of the SW TLRs (preliminary)

deliveries according to the SoW document

- first concept of Operations and Calibration Plan
- first concept of User Manual

# HIRES observing modes - basic concepts

- each obs mode will have dedicated fiber bundle(s)
- each observing mode will be selectable in the front-end
- different bundles can have different fiber coupling in the fiber-to-fiber interface, optimized either for very accurate RVs (*e.g.* double-scrambling) or for faint objects
- in seeing limited mode spectral resolution defines the sky-projected angular size of the fiber (**a**)
- aperture on sky (**A**) is defined by the angular size of the fiber bundle ( $\mathbf{A} = \mathbf{a} \times \sqrt{N_{\text{fibers}}}$ )
- for a given **a** there is a maximum number of available fibers, that can be either accommodated in a single aperture or split in multiple (2) sub-apertures
- in IFU-AO mode the same spectral resolution can be obtained with different spaxel scales, down the diffraction limit

**# of obs modes** → **tradeoff among science priorities, cost & complexity also in terms of calibration and maintenance**



# HIRES science operations & calibration: basic concepts

- HIRES should be available for science observations anytime during the night and in any configuration/obs mode
- HIRES can be calibrated anytime when it is not observing, since the calibration light will directly feed the instrument, without requiring the use of the telescope itself or any other telescope infrastructure
- all the observing modes should be calibrated in day-time, before and/or after each observing night
- during the night, when HIRES is not observing, one can perform additional calibrations short enough to complete the cycle (or to easily interrupt it), if HIRES will be requested to switch to observing modality on short notice
- in order to minimize the workload on the ESO-ELT personnel, some automatic, programmable running of the calibration procedures should be implemented