



Additional Science

Module of the
PLATO Science Preparation
Management

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Additional Science

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Non-Core Science

Core Science:

detect **exoplanets**, understand planets and planetary systems, with need to know *precisely* age, mass, radius and chemistry of **planet hosting stars**.



Need to significantly improve stellar structure and stellar evolution also of star types with probably non existent/detectable planets

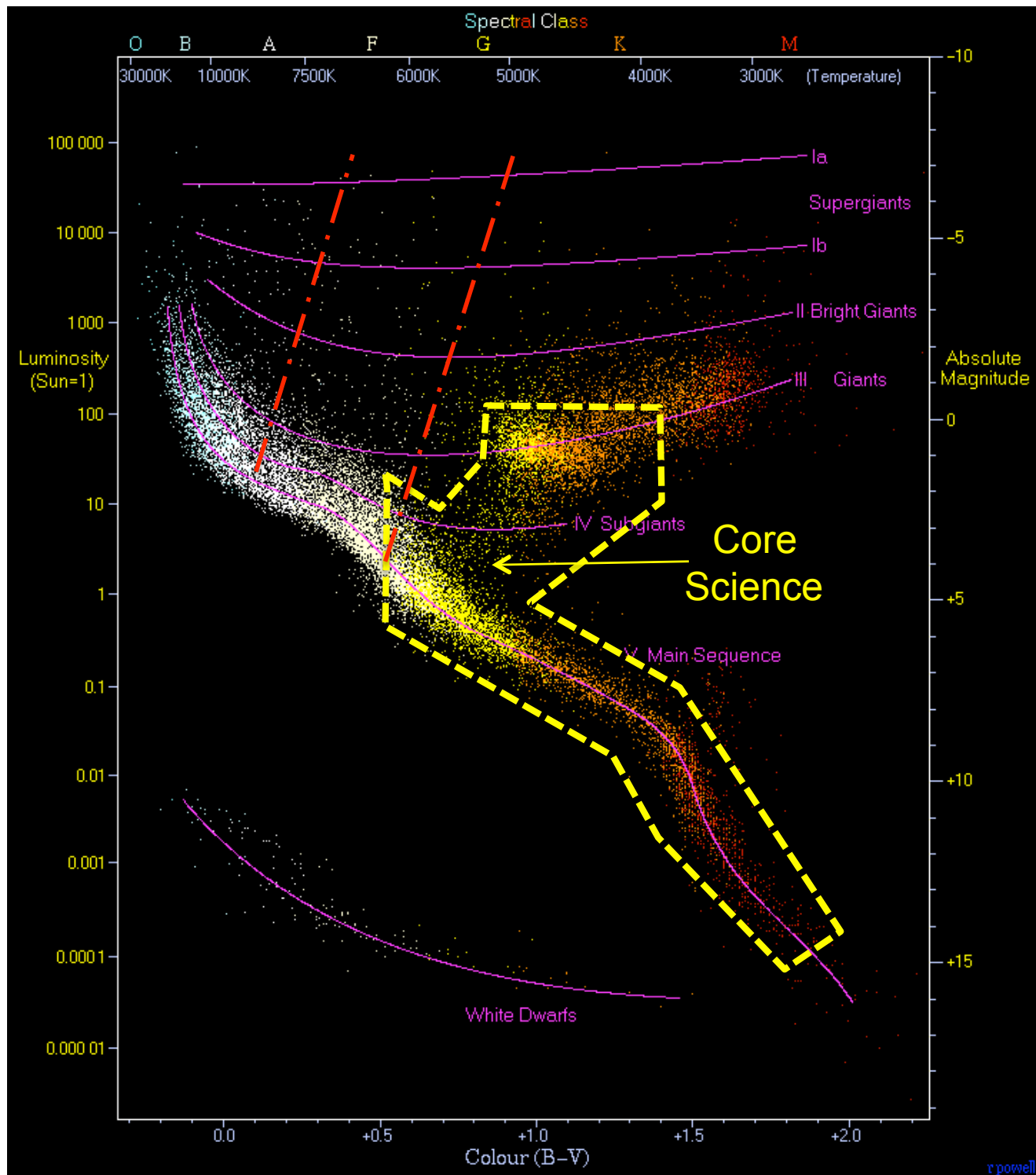
Additional Science, better:

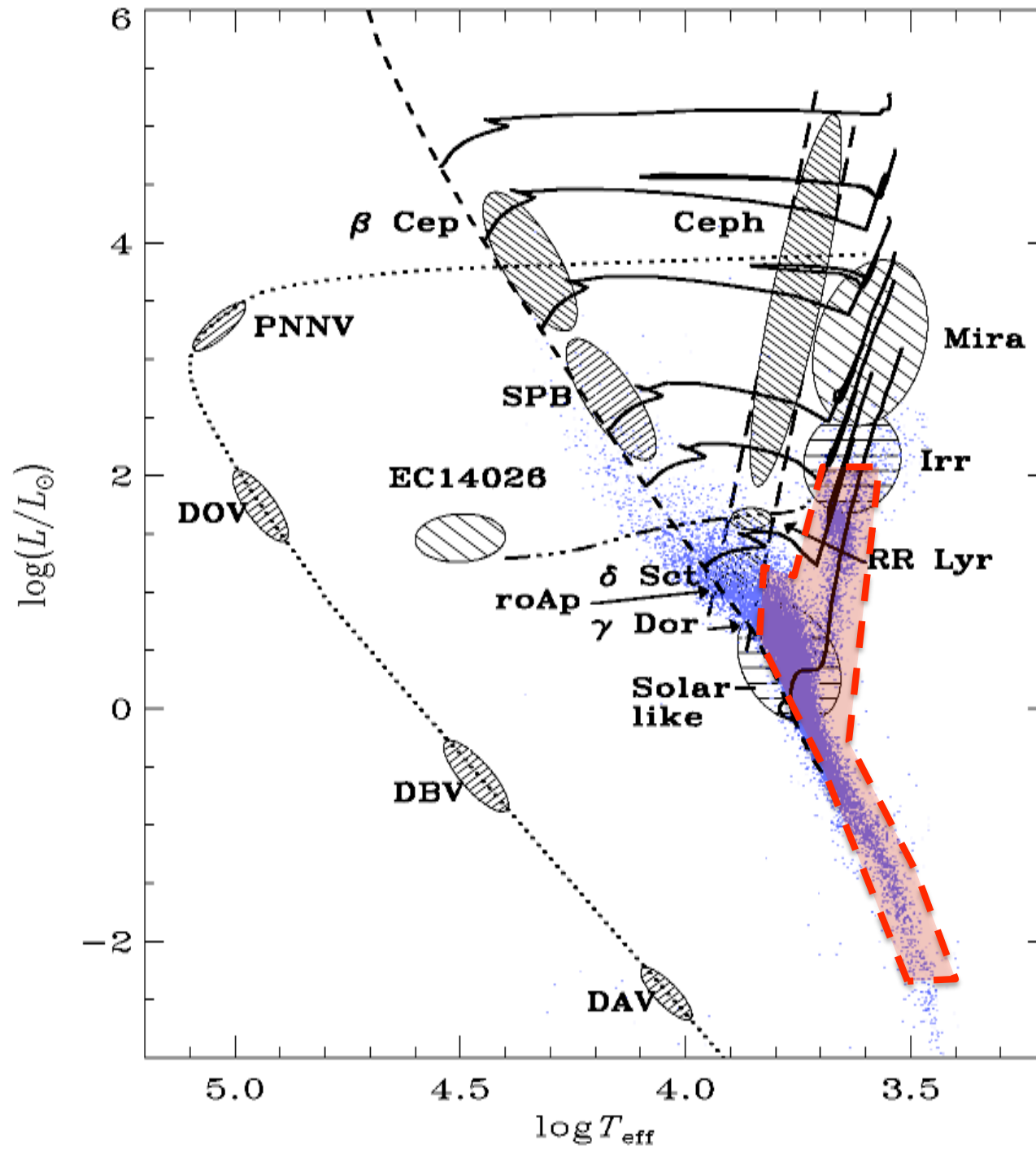
Complementary Science

160 000 ADDITIONAL SCIENCE

The “Additional Science” work packages focus on

- **stars of spectral type F or hotter** (excluding planet hosting stars and solar like pulsation), on
- **evolved stars except Red Giants**, and on
- **non-stellar targets** observed by PLATO



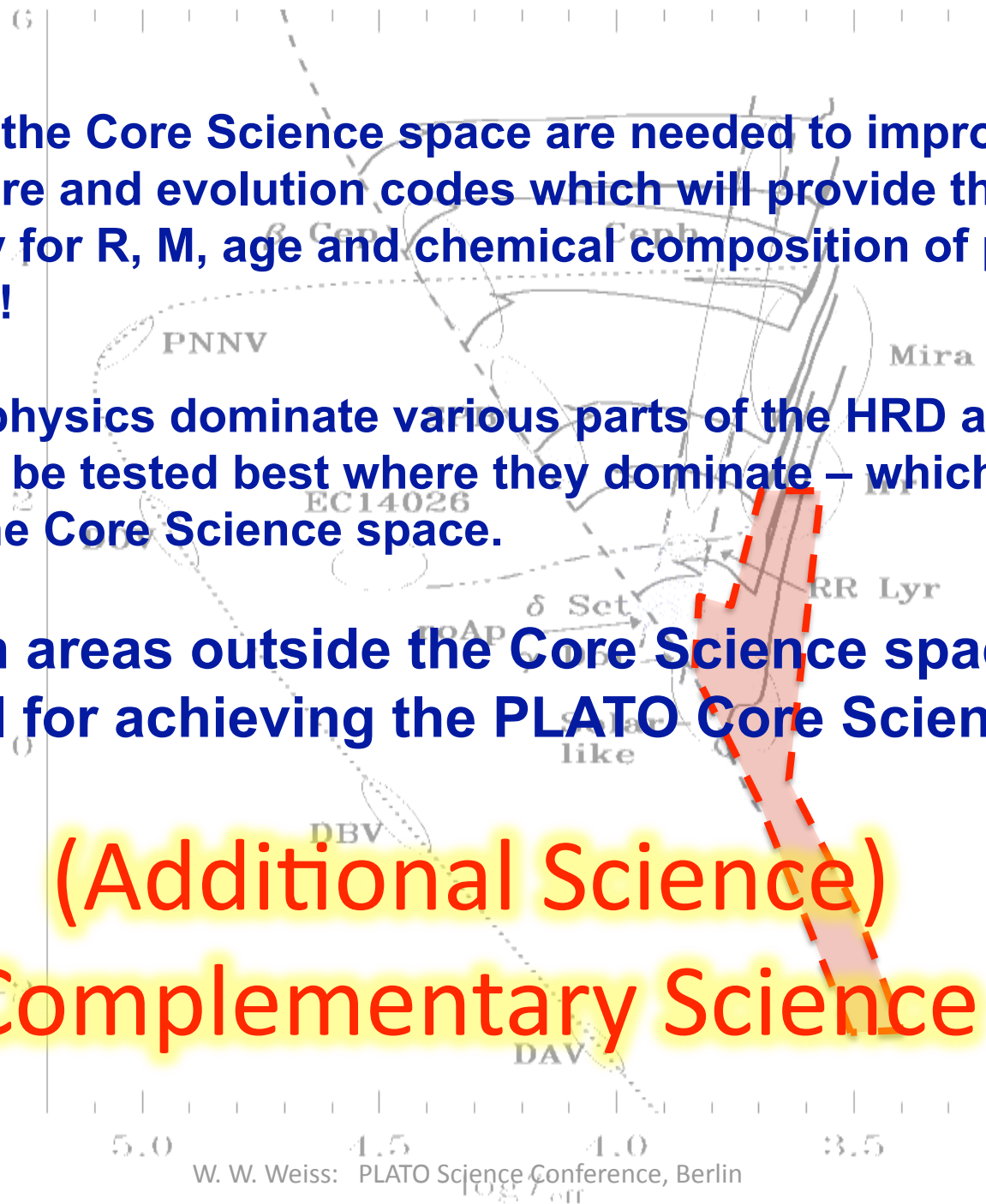


Stars outside the Core Science space are needed to improve & test stellar structure and evolution codes which will provide the requested high accuracy for R, M, age and chemical composition of planet hosting stars !

Still missing physics dominate various parts of the HRD and a proper treatment can be tested best where they dominate – which is not necessarily the Core Science space.

Research in areas outside the Core Science space will be very helpful for achieving the PLATO Core Science goal.

(Additional Science)
Complementary Science



Present WP 160 Structure

161 000 Data preparation:

- 161 100 Merging light curves and homogenization
- 161 200 Photometric calibration

162 000 Global stellar characterization of stars addressed by Additional Science:

- 162 100 Stellar Evolution
- 162 200 Rotation (merge with 162 500?)
- 162 210 Chemical Abundances
- 162 300 Activity & Accretion
- 162 400 Granulation
- 162 500 Surface imaging & magnetic field
- 162 600 Clusters & Stellar Associations

163 000 Stellar Variability (excluding stars which (also) pulsate):

- 163 100 EB
- 163 200 Compact accreting binaries (previously Novae and Cataclysmic Variables)
- 163 300 AGN
- 163 400 Microlensing
- 163 500 YSOs

Cont.

164 000 Pulsation of stars addressed by Additional Science:

164 100 PMS

164 200 Beta Ceph:

164 205 O, WR & LBV stars

164 210 SPB

164 220 Be

164 300 Delta Scuti

164 310 roAp

164 320 Gamma Doradus

164 330 Hybrids:

164 400 Cepheids

164 500 Red Giants

164 600 RR Lyr & HADS

164 700 AGB

164 800 Compact pulsators

164 900 Miscellaneous (H-deficient stars, SN,...)

165 000 Moving targets:

165 100 Asteroids

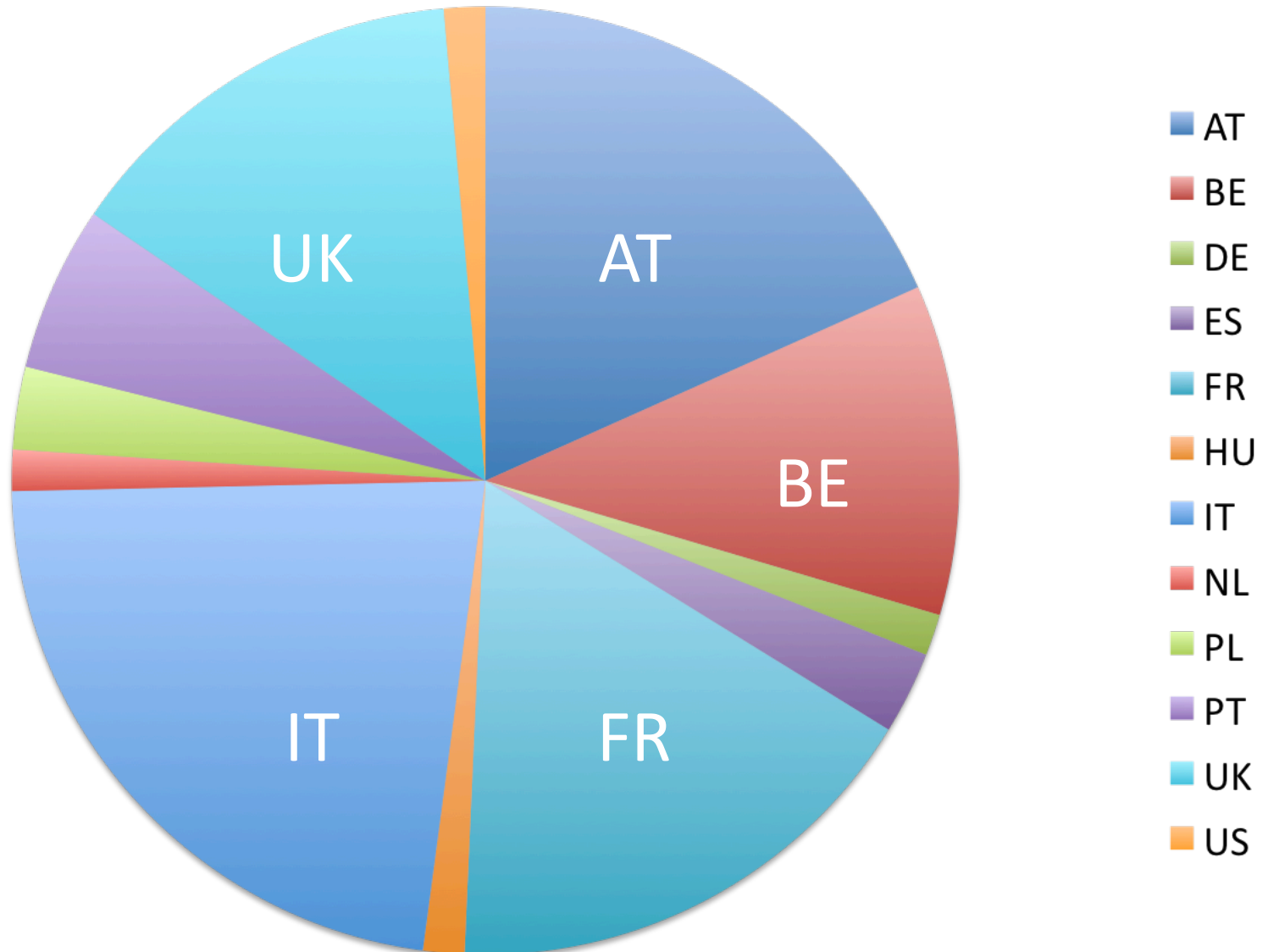
165 200 Cometary nuclei

165 300 Kuiper belt objects

165 400 Stellar Occultations (by solar system minor bodies)

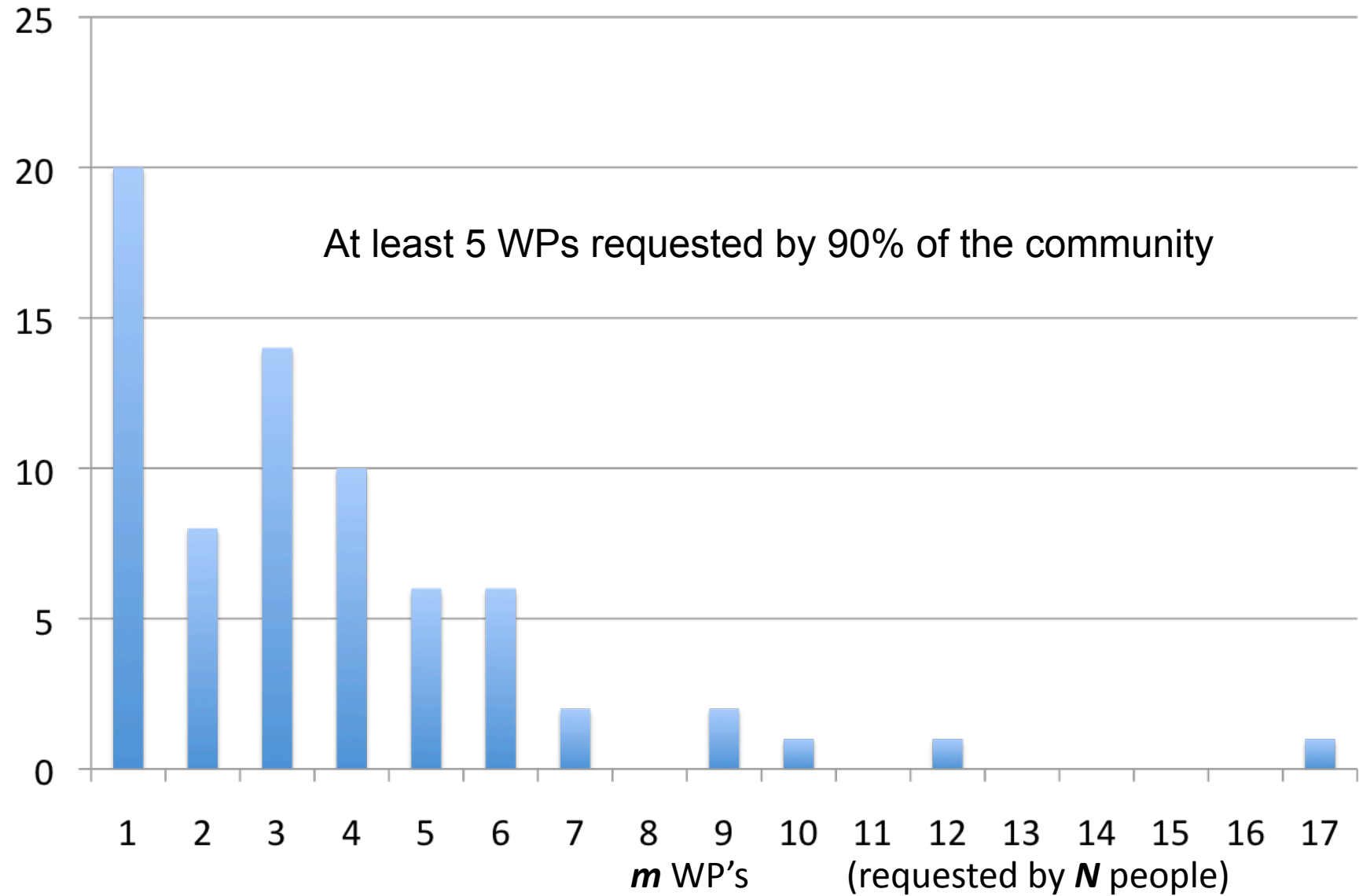
166 000 Ground based support:

Participation



Involvement

N people



Streamlining of WPs

161 000 Data preparation:

161 100 Merging light curves and homogenization

161 200 Photometric calibration

162 000 Global stellar characterization of stars:

162 100 Stellar Structure and Evolution

162 200 Stellar Surface Physics

- 200 Rotation
- 210 Chemical Abundances
- 300 Activity & Accretion
- 400 Granulation
- 500 Surface imaging & magnetic field

162 300 Clusters & Stellar Associations

163 000 Photometric Variability (excluding stars which also do pulsate):

163 100 Stellar

- 100 EB
- 200 Compact accreting binaries
(previously Novae and Cataclysmic Variables)
- 500 YSOs

163 200 Non-Stellar

- 300 AGN
- 400 Microlensing

164 000 Pulsating stars addressed by Additional Science:

164 100 Lower Classical Instability strip (including subgiants)

- 100 PMS
- 300 Delta Scuti
- 310 roAp
- 320 Gamma Doradus
- 330 Hybrids:

164 200 Hotter than Classical Instability Strip

- 200 Beta Ceph
- 205 O, WR & LBV stars
- 210 SPB
- 220 Be

164 300 Evolved stars (Upper Classical Instability Strip and Cooler)

- 400 Cepheids
- 500 Red Giants ----> Core Science ($LC \leq III$)
- 600 RR Lyr & HADS
- 700 AGB
- 800 Compact pulsators

164 400 Miscellaneous (H-deficient stars, SN,...)

165 000 Moving targets:

- 100 Asteroids
- 200 Cometary nuclei
- 300 Kuiper belt objects
- 400 Stellar Occultations (by solar system minor bodies)

166 000 Ground based support (Sub-WPs requested):

- spectroscopy, photometry, polarimetry

Complementary Science WPs

161 000 Data preparation:

161 100 Merging light curves and homogenization

161 200 Photometric calibration

162 000 Global stellar characterization:

162 100 Stellar Structure & Evolution

162 200 Stellar Surface Physics

162 300 Clusters & Stellar Associations

163 000 Photometric Variability (excluding stars which also do pulsate):

163 100 Stellar

163 200 Non-Stellar

164 000 Pulsating stars:

164 100 Mode identification of rapidly rotating stars

164 200 Lower Classical Instability strip (including subgiants)

164 300 Hotter than Classical Instability Strip

164 400 Evolved stars (Upper Classical Instability Strip and Cooler and below the ZAMS)

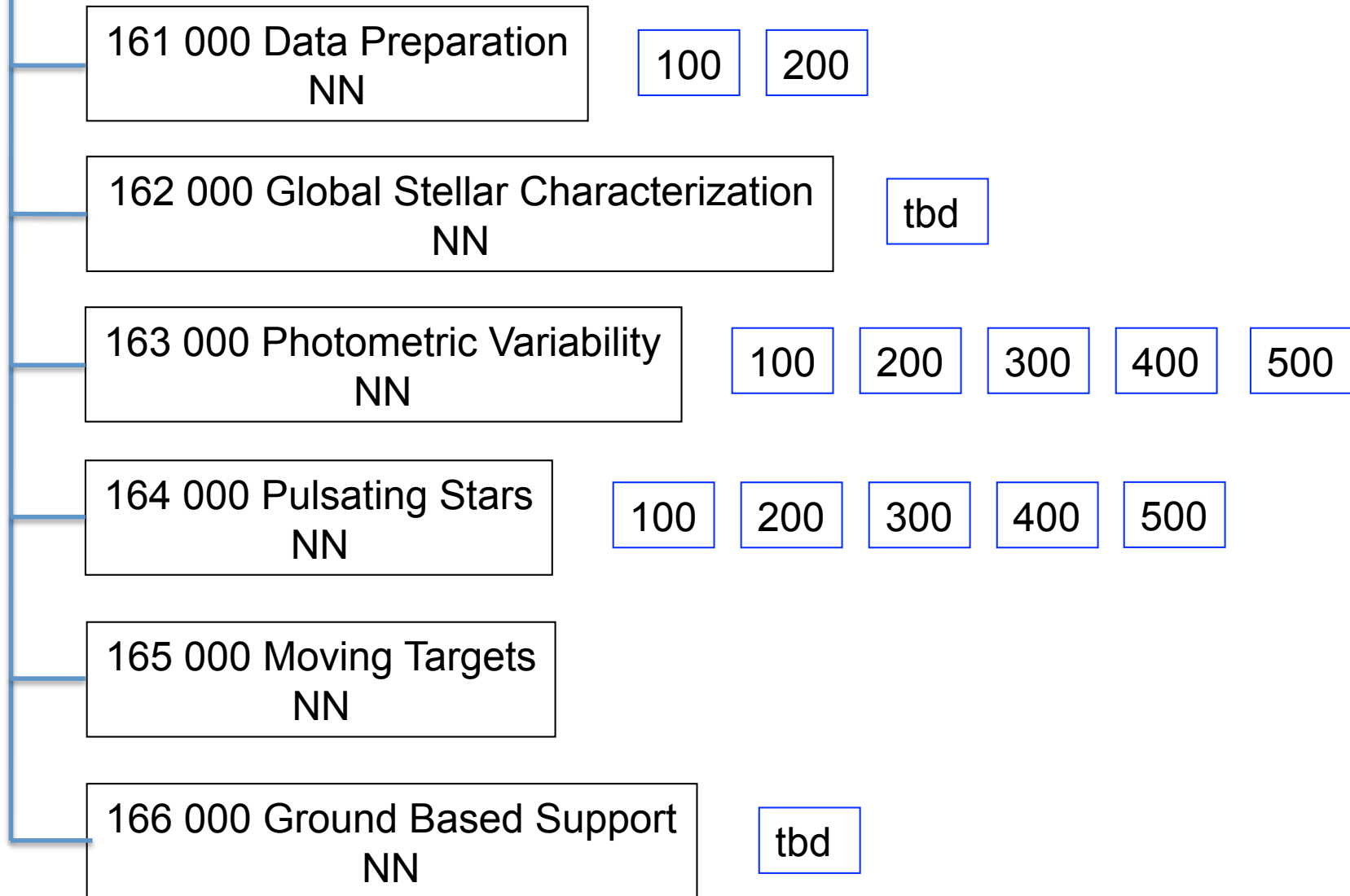
164 500 Miscellaneous (H-deficient stars, SN,...)

165 000 Moving targets:

166 000 Ground based support (Sub-WPs requested):

- spectroscopy, photometry, polarimetry

160 000 Complementary Science





Complementary Science

Synergy with other PSPM WPs

LoI !!