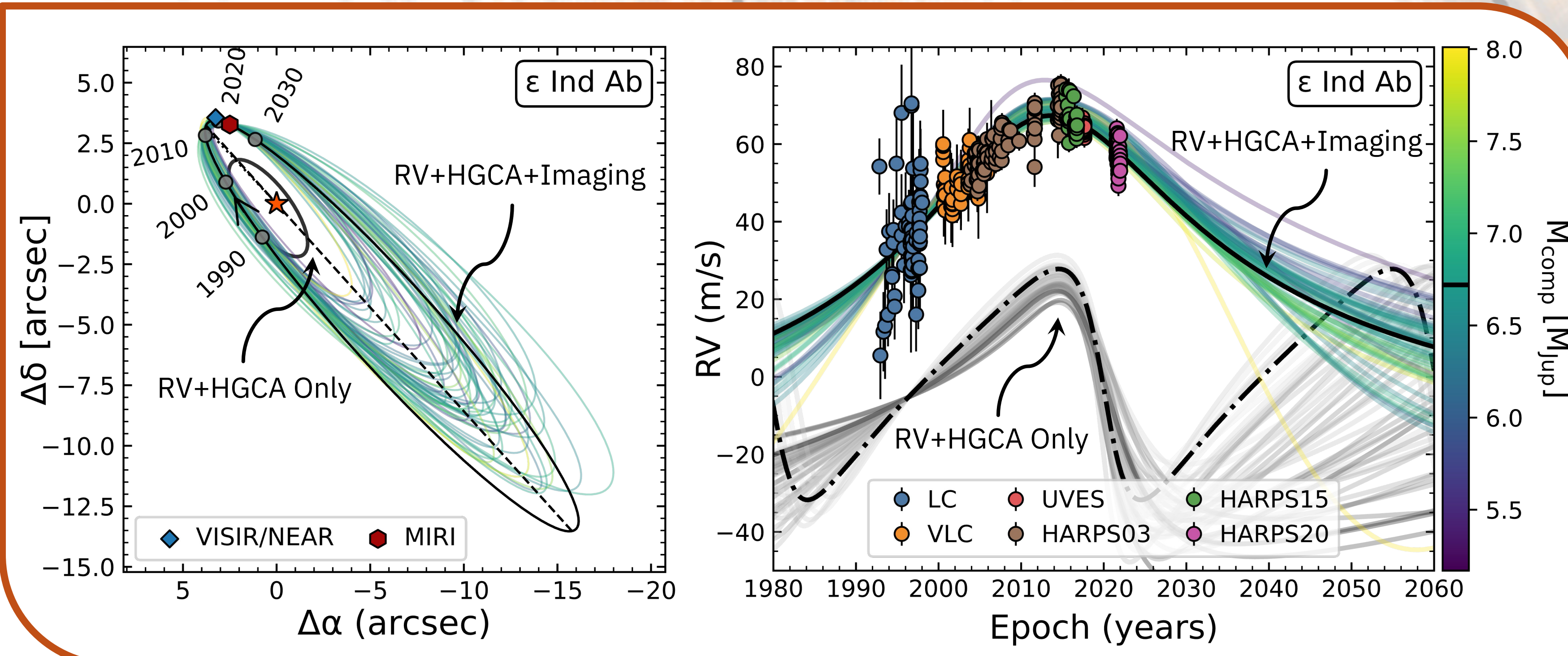
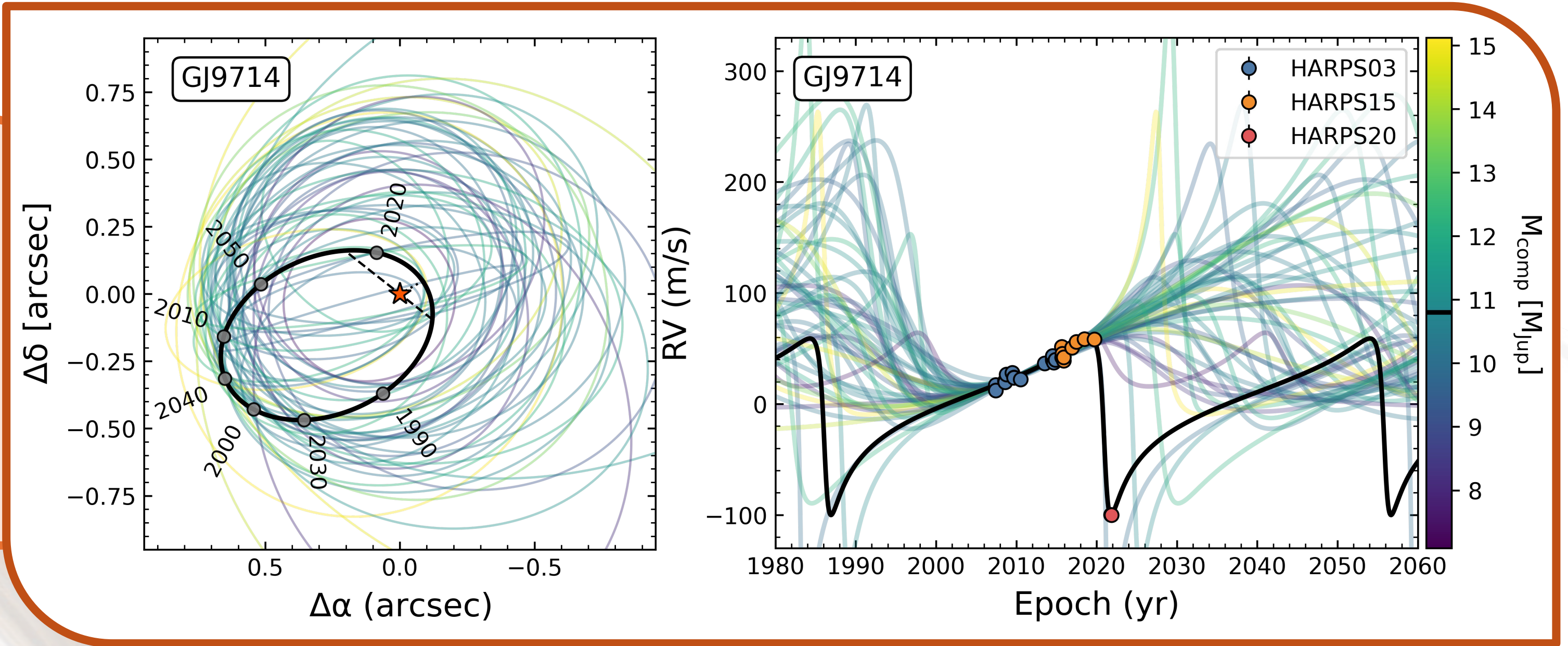




PREDICT – Why prediction matters?

For very long-period planets, incomplete RV baselines introduce strong degeneracies in mass and orbit – limiting our ability to predict on-sky positions for direct detection and characterization. Without reliable predictions, **direct imaging campaigns risk pointing at the wrong place.**

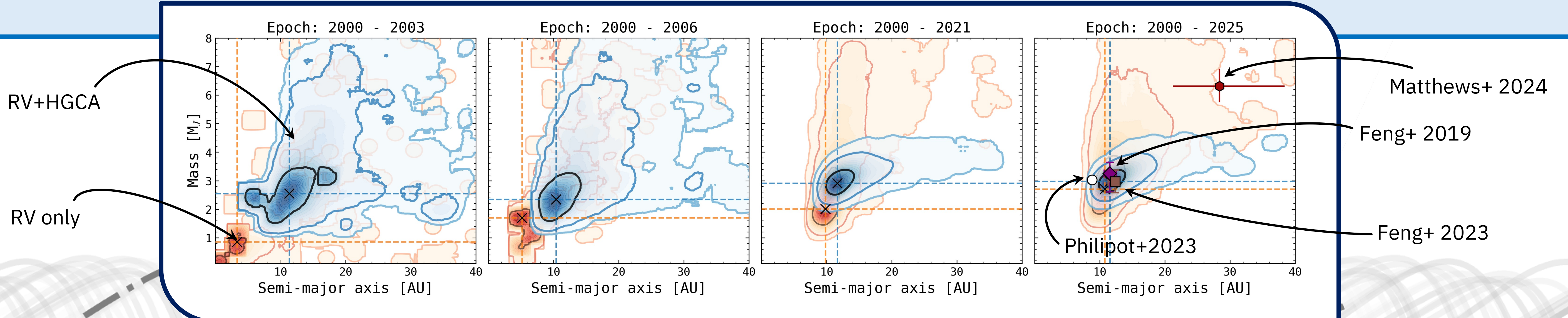


PREDICT in practice – *ε Ind Ab*

ε Ind Ab is the first solar-age giant exoplanet to be imaged. Earlier RV+HGCA fits predicted a lighter, closer planet in the wrong quadrant. However, **imaging revealed a heavier, more distant planet.** This shows how **limited data can mislead orbital predictions.**

POINT – Targeting planets with precision

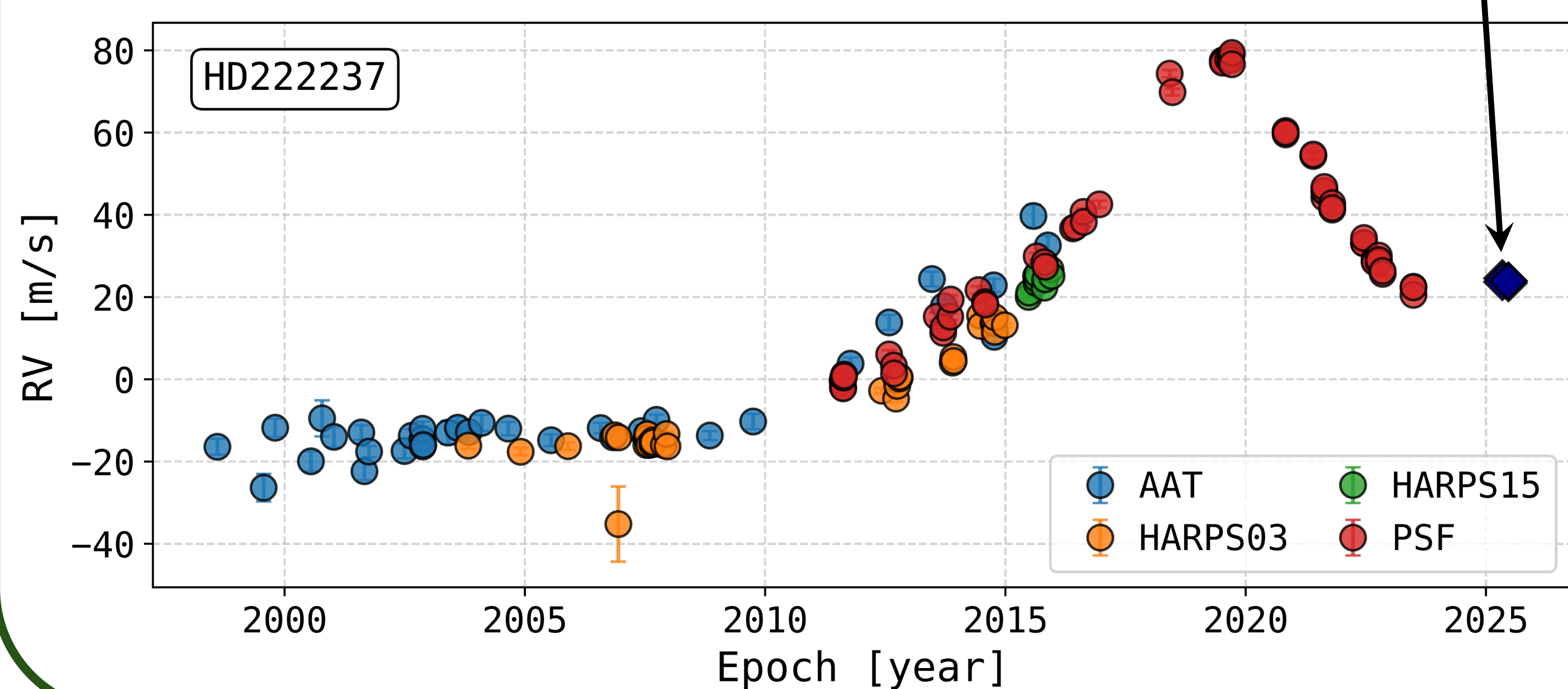
To **point** future imagers correctly, we **jointly model RV + long-baseline astrometric anomaly**, to refine our predictions of where planets truly are. Using *ε Ind Ab* as a test case, we fit different subsets of RV data across different epochs and observe how posterior solutions shift – and **how the inversion in RV curve shrinks the allowed parameter space.**



PROBE – HARPS program

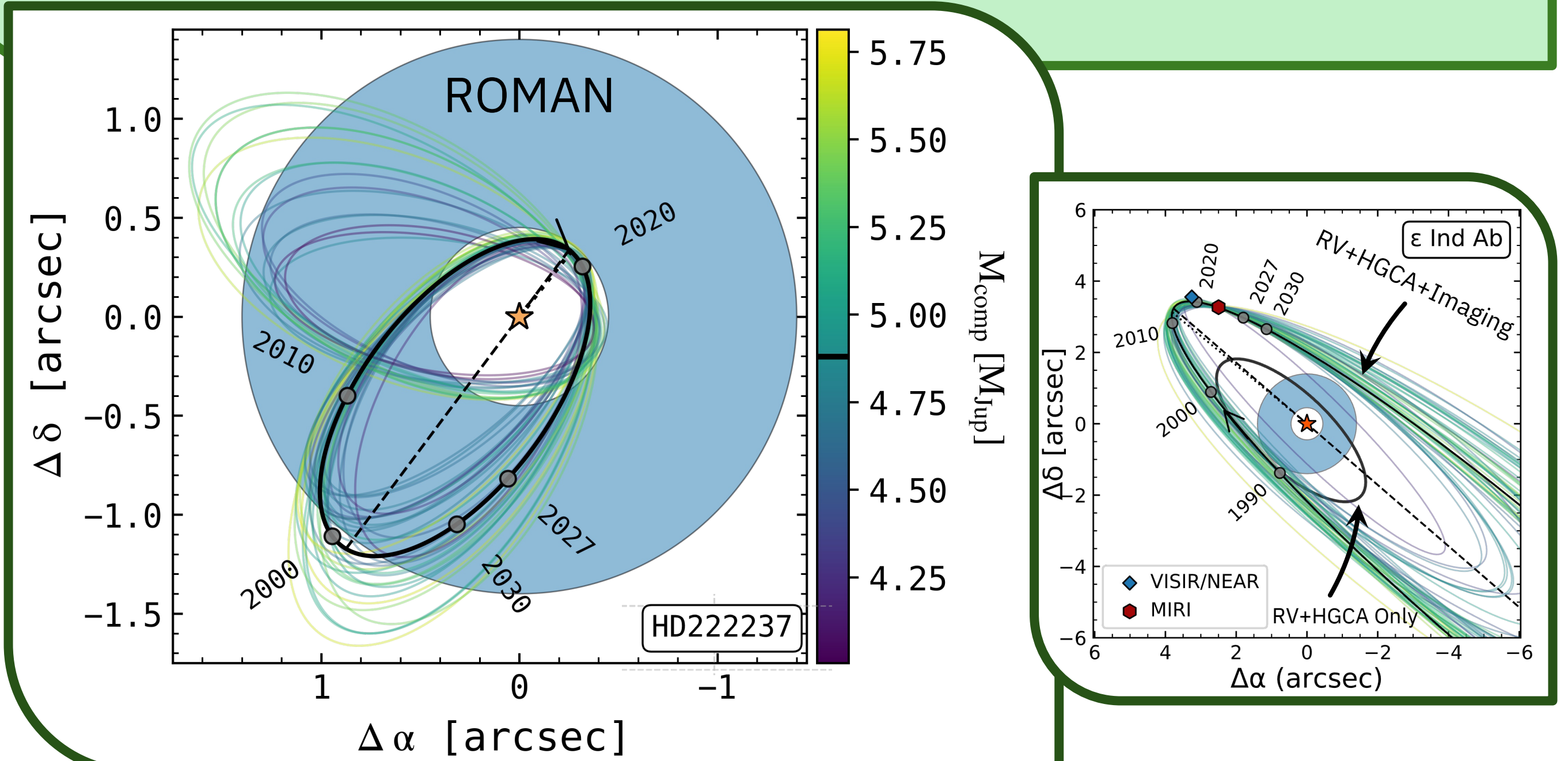
To **reduce degeneracies** and **improve orbit predictions for future imaging campaigns**, I am leading a HARPS program to extend the RV baselines eight nearby long-period giants.

New HARPS Observations!



PROBE – THE FUTURE

Improved orbital predictions are essential for targeting upcoming facilities such as JWST, Roman, and the ELTs. Our program will deliver benchmark systems where **dynamical masses and luminosities can be directly compared** – critical for calibrating planet formation and evolution models.



TAKE HOME!

For very long period exoplanets, predicting on-sky location from RV + HGCA is challenging, but incorrect predictions are dangerous as we attempt to image these planets. Continual RV monitoring can help mitigate this issue.

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