



Homebrew-Pipelines: A Homebrew distribution of ESO Instrument Pipelines



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INTRODUCTION

The European Southern Observatory (ESO) provides data reduction pipelines for the majority of current VLT instruments, several La Silla instruments and all future VLT and ELT instruments. Currently, there are approximately 30 pipelines available, each with a status of either active, end of maintenance, or operational on hold. These distributions include a combination of C and Python code, as well as static calibration data in FITS format.

THE PROBLEM

Maintaining both source and binary distributions for such a large and diverse set of packages across multiple operating systems presents considerable challenges. In particular, supporting recent macOS versions on both Intel and ARM64 architectures, as well as various Linux distributions, requires substantial effort. Until recently, supported installation methods included installation from source code, RPM (for Fedora, CentOS, and Scientific Linux), and MacPorts (for macOS). The absence of a native Ubuntu distribution of the pipelines forced users to compile the software from source kits, a time-consuming and resource-intensive process susceptible to build failures on specific system configurations.

THE SOLUTION

To mitigate these issues, we have extended the existing distribution mechanisms by introducing container-based installations using Apptainer and Homebrew-based installations. The latter supports multiple macOS versions and is compatible with various Linux distributions (including Ubuntu), offering a more flexible and user-friendly installation experience.

INSTALLING A PIPELINE WITH HOMEBREW

1. Install Homebrew (<https://brew.sh/>)
2. "Tap" (clone) the ESO repository
brew tap eso/pipelines
3. Install a pipeline
brew install esopipe-'pipeline-name'
Example: brew install esopipe-uves

AVAILABLE PIPELINES

Active: *cr2re, eris, esotk, espdr, gravity, harps, kmos, matisse, molecfit, muse, nirps, spher*

Operational on hold: *detmon, fors, giraf, hawki, uves, visir, xshoo*

End of maintenance: *amber, crires, efosc, espda, isaac, midi, naco, sinfo, sofi, vcam, vimos*



Homebrew

"The Missing Package Manager for macOS (or Linux)"

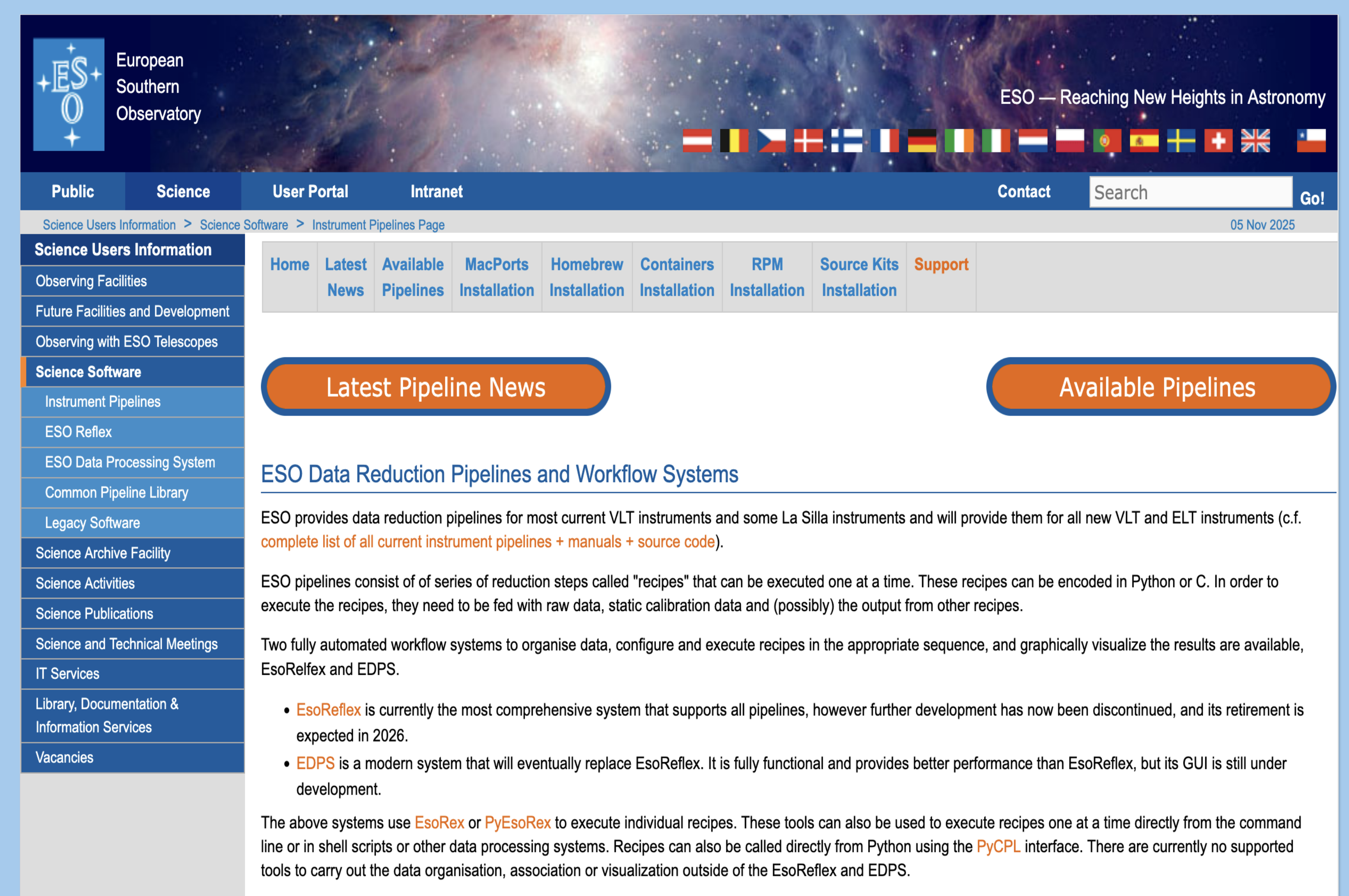
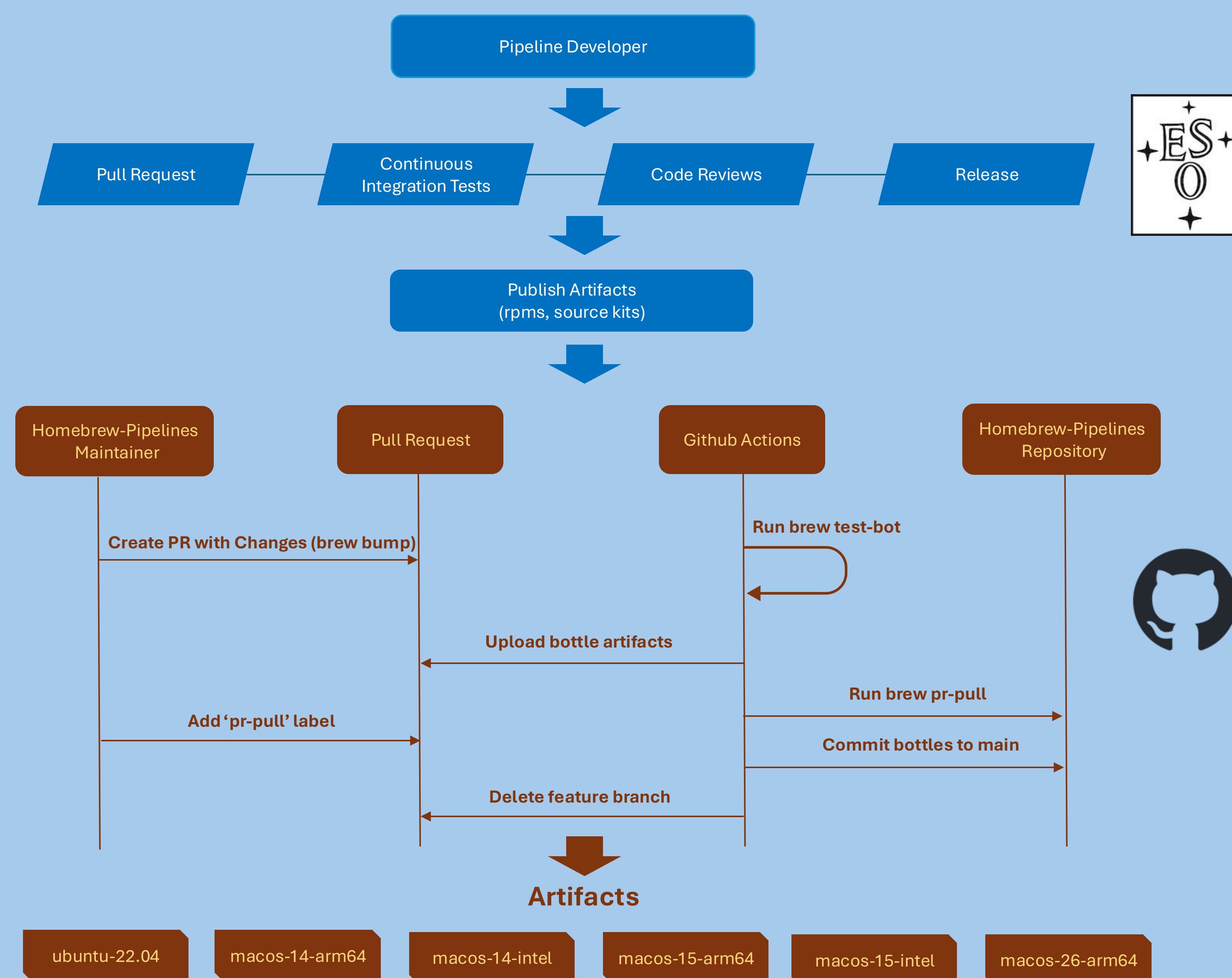
"Homebrew installs the stuff you need that Apple (or your Linux system) didn't."

Formula: package definition script (esopipe-uves.rb)

Tap: third-party repository (<https://github.com/eso/homebrew-pipelines>)

Bottle: pre-built package

Other terms: *Cask, Keg, Rack, Cellar etc.*



<https://www.eso.org/sci/software/pipelines/>

RECCOMENDED INSTALLATION METHODS FOR ESO PIPELINES

MacOS

1. **Homebrew**
2. MacPorts
3. Source code

Fedora & CentOS

1. RPM
2. **Homebrew**
3. Apptainer
4. Source code

Ubuntu & other Linux distributions

1. **Homebrew**
2. Apptainer
3. Source code

Windows

1. WSL2 with Ubuntu and **Homebrew**
2. WSL2 with Ubuntu and source code