

The Debian Astro project

A Debian Pure Blend for astronomy and astrophysics

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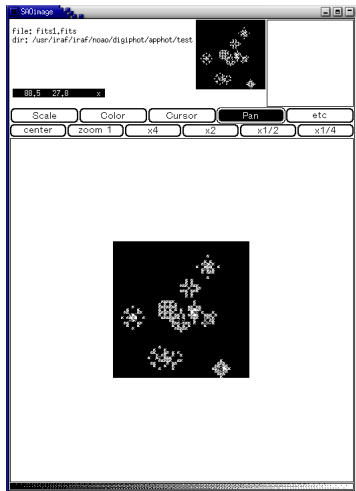
Bochum, 2016-09-14



Leibniz Institute for
Astrophysics Potsdam



History of Debian Astro



- First packages: saomage (1999), cfitsio (2000), iraf (2000), sextractor (2002), pyfits (2006)
- After 2006, many packages got unmaintained; bitrot, partial removal
- 2014 start with mailing list and alioth project
- 2016 official announcement of the Debian Astro Pure Blend
- Logo created by Maria Hammerstrom

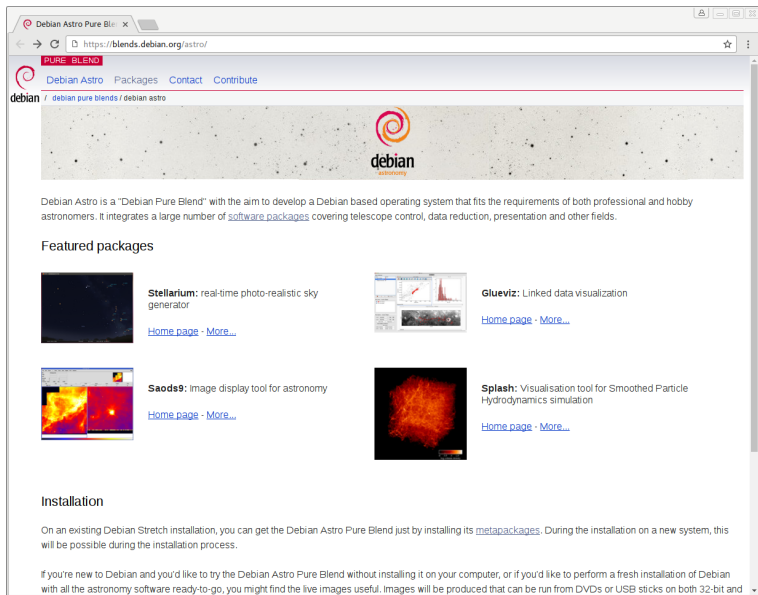


The Debian Astro Pure Blend

- *Blended tea*: a combination of different kinds of teas to guarantee consistent quality (Wikipedia)
- Method to organize Debian astronomy packages
 - currently 227 packages, (29 more in preparation)
 - 17 metapackages
 - Web page, “tasks” pages
 - Handle citations, ASCL entries
- Completely integrated into Debian (*Pure*)
- Goal: release the Blend with Debian Stretch (estimated 2017)
 - integrated in standard installer
 - special Debian Astro installation images
 - Life system (CD/USB, virtual machines)



Debian Astro Web Pages




The screenshot shows a web browser window displaying the Debian Astro Pure Blend website. The browser's address bar shows the URL `https://blends.debian.org/astro/`. The website has a navigation menu with links for "Debian Astro", "Packages", "Contact", and "Contribute". Below the navigation is a banner featuring the Debian Astronomy logo, which consists of a stylized orange and red spiral above the text "debian astronomy". The main content area includes a paragraph describing Debian Astro as a "Debian Pure Blend" system for professional and hobby astronomers. It lists "Featured packages" with four items: Stellarium (real-time photo-realistic sky generator), Glueviz (linked data visualization), Saads9 (image display tool for astronomy), and Splash (visualisation tool for Smoothed Particle Hydrodynamics simulation). Each package entry includes a small thumbnail image and a link to its "Home page" and "More...". At the bottom, there is an "Installation" section with text explaining how to install the system on an existing Debian Stretch installation or how to perform a fresh installation.

Debian Astro Pure Blend


Debian Astro Packages Contact Contribute


debian / [debian pure blends](#) / [debian astro](#)





Debian Astro is a "Debian Pure Blend" with the aim to develop a Debian based operating system that fits the requirements of both professional and hobby astronomers. It integrates a large number of [software packages](#) covering telescope control, data reduction, presentation and other fields.

Featured packages

 **Stellarium:** real-time photo-realistic sky generator
[Home page](#) - [More...](#)

 **Glueviz:** Linked data visualization
[Home page](#) - [More...](#)

 **Saads9:** Image display tool for astronomy
[Home page](#) - [More...](#)

 **Splash:** Visualisation tool for Smoothed Particle Hydrodynamics simulation
[Home page](#) - [More...](#)

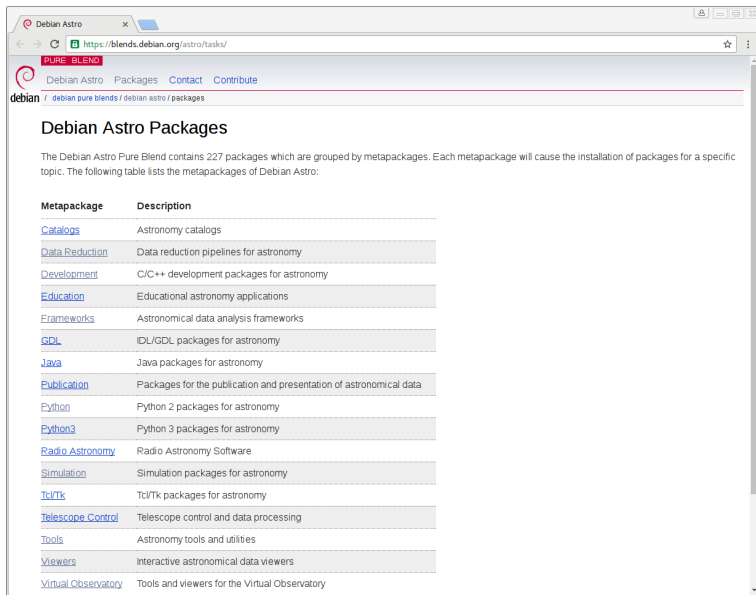
Installation

On an existing Debian Stretch installation, you can get the Debian Astro Pure Blend just by installing its [metapackages](#). During the installation on a new system, this will be possible during the installation process.

if you're new to Debian and you'd like to try the Debian Astro Pure Blend without installing it on your computer, or if you'd like to perform a fresh installation of Debian with all the astronomy software ready-to-go, you might find the [live images](#) useful. Images will be produced that can be run from DVDs or USB sticks on both 32-bit and



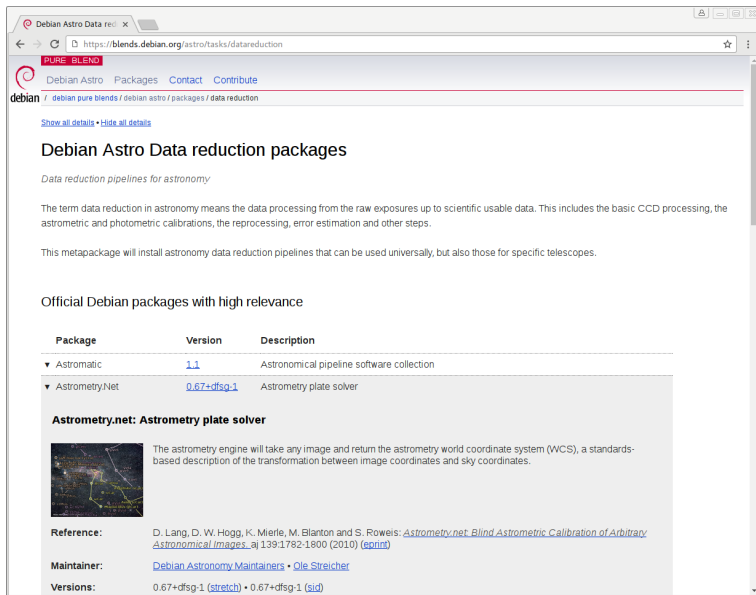
Debian Astro Web Pages



The screenshot shows a web browser window with the URL <https://blends.debian.org/astro/tasks/>. The page title is "Debian Astro Packages". Below the title, there is a paragraph explaining that the Debian Astro Pure Blend contains 227 packages grouped by metapackages. A table lists these metapackages and their descriptions.

Metapackage	Description
Catalogs	Astronomy catalogs
Data Reduction	Data reduction pipelines for astronomy
Development	C/C++ development packages for astronomy
Education	Educational astronomy applications
Frameworks	Astronomical data analysis frameworks
IDL	IDL/GDL packages for astronomy
Java	Java packages for astronomy
Publication	Packages for the publication and presentation of astronomical data
Python	Python 2 packages for astronomy
Python3	Python 3 packages for astronomy
Radio Astronomy	Radio Astronomy Software
Simulation	Simulation packages for astronomy
Tcl/Tk	Tcl/Tk packages for astronomy
Telescope Control	Telescope control and data processing
Tools	Astronomy tools and utilities
Viewers	Interactive astronomical data viewers
Virtual Observatory	Tools and viewers for the Virtual Observatory





The screenshot shows a web browser window displaying the Debian Astro Data reduction packages page. The browser's address bar shows the URL `https://blends.debian.org/astro/tasks/datareduction`. The page header includes the Debian logo and navigation links for "Debian Astro", "Packages", "Contact", and "Contribute". The main heading is "Debian Astro Data reduction packages", with a subtitle "Data reduction pipelines for astronomy". The text explains that data reduction in astronomy involves processing raw exposures into scientific data, including CCD processing, calibrations, and reprocessing. It also notes that the metapackage installs astronomy data reduction pipelines, some universal and some specific to telescopes. A section titled "Official Debian packages with high relevance" contains a table with the following information:

Package	Version	Description
▼ Astromatic	1.1	Astronomical pipeline software collection
▼ Astrometry.Net	0.67+dfsg-1	Astrometry plate solver

Below the table, there is a detailed entry for "Astrometry.net: Astrometry plate solver". It includes a small image of a star field with coordinate lines, a description of the astrometry engine's function, a reference to a 2010 paper by Lang et al., the maintainer "Debian Astronomy Maintainers • Ole Streicher", and the version information "0.67+dfsg-1 (stretch) • 0.67+dfsg-1 (sid)".

- cfitsio, ccfits, qfits
- wcslib
- wcstools
- ESO cpl
- Starlink AST, PAL
- healpix (C, C++,Python)
- SOFA, PGPLOT (non-free)
- selected common science packages: fft, cminpack etc.

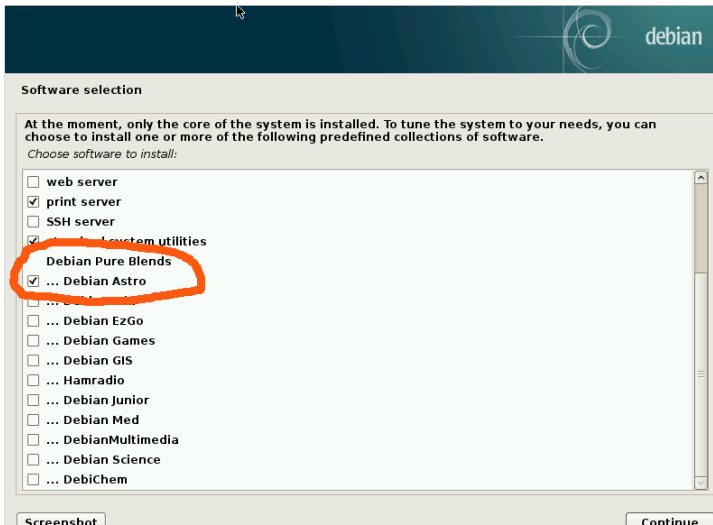


Debian Astro Pure Blend Contents

- Python 2/3
 - Astropy
 - affiliated packages
- "Legacy"
 - ESO-MIDAS
 - Tcl/Tk (DS9, fv, skycat)
 - GDL (IDL replacement)
 - no IRAF
- Java/Virtual Observatory
 - Aladin (in preparation)
- Radio Astronomy
 - casacore, python-casacore
- much more (education, publication, amateurs, ...)



Debian Astro Installation



The Debian Astro Team

- Mailing list: 140 subscribers
- Team members
 - total: 32
 - uploaders: 13
- Team maintained source packages: 101
 - mainly git repositories
 - some SVN
- Most packages have only one maintainer
- 1-day sprint last year at Debconf
- Some package not maintained by the Debian Astro team
 - educational
 - cfitsio ...



Advantages for Public Packaging: Technical

- Testing:
 - install tests on 22 platforms (10 official, 12 inofficial)
 - regular CI tests (on each dependency change)
 - repeated “inofficial” install tests (Reproducible builds)
 - people doing research with software metrics
 - bug tracker is already there
- Coupled to distribution development
- Dependencies are recognized
 - automated “transitions” (recompilations) when ABI breaks
 - prevent from silent removal of dependencies
- Automatic migration to Ubuntu



Advantages for Public Packaging: Social

- Self-magnification: a strong Debian Astro Pure Blend will attract more people to contribute
- Others may contribute to your package: bugfixes etc.
- Debian is “bazaar” style: everyone can follow, everyone can contribute, development is transparent
- Packages may get some attention even if “orphaned”
 - Non-maintainer uploads (NMU)
 - QA team
 - package adoption
- Coordinate / Avoid duplication of development efforts



Debian as a Reference Platform

- Almost standard linux
- High quality standards
- Clear, consistent structure: comprehensive Debian policy, specific policies for different fields: Python, Java, Tcl/Tk, Science
- Lots of tools for packaging + package checks
- Patches from Debian often migrate upstream or “side stream” (to Macports, Fedora, ...)



Packaging Rules, “Policy”

- Social Contract + Debian Free Software Guidelines: strict rules
- Debian policy
 - completely build from source
 - no convenience copies of code; re-use existing libraries
 - recursive packaging (package dependencies first, ...)
 - file system standard
 - package names, ...
- Specific policies (Python, Java, Tcl/Tk, Science)
- Portability (10 official architectures)
 - 32 vs. 64 bit
 - byte order
- Team maintenance



Comparison to other approaches

	Debian Astro	Fedora Astronomy	STScI AstroConda	ESO SciSoft
Release year	≥ 2017	2016	2016	2014
Operating System	Linux+	Linux	Linux,Mac	Linux
Binary Packages	227	73	75	102
Integrated in OS	yes	yes	no	no
Install as Non-root	no	no	yes	no
All sources available	yes	yes	partly	no
CI tests	yes	no	no	no
Mailing list	yes	yes	yes	no
Bug tracker	yes	yes	(yes)	no



debian
astronomy

- Stable version: package versions fixed after distribution release
 - currently “Jessie”
 - updates: Only bug fixes, no new versions
- Backports: new versions, need to be maintained!
 - new versions
 - no automated backporting, need to be maintained
- Ubuntu: similar, but needs extra approval
- No specific workflow in Debian Astro yet
 - may be adopted from NeuroDebian
 - first steps recently with Astropy



- Licensing
 - unclear or unspecified license from upstream
 - files or code copied from somewhere else
 - “stolen” code: Numerical Recipes
- Dependencies and convenience copies
 - non-free
 - try free replacement: IDL → GDL, PGPLOT → giza
 - package for “contrib” area
 - not packaged yet → packaging of dependency needed
 - outdated: try to migrate to latest version
 - local changes: discuss with upstream



- Origin often unclear
- License often unclear or restrictive
- Large package size
- Often impossible to create from a “source”
- Possible solutions:
 - Discuss with upstream and on the debian-astro mailing list
 - Try harder ;-)
 - Download during install: package must go to contrib
 - Package in non-free



- Policy: <https://www.debian.org/doc/debian-policy>
- Developers Reference:
<https://www.debian.org/doc/manuals/developers-reference>
- Web page: <https://blends.debian.org/astro>
- Mailing lists:
 - Astro: <https://lists.debian.org/debian-astro>
 - Python: <https://lists.debian.org/debian-mentors>
 - Mentors: <https://lists.debian.org/debian-mentors>
 - Common development: <https://lists.debian.org/debian-devel>
- Alioth project:
<https://alioth.debian.org/projects/debian-astro>
- Git repositories:
<http://anonscm.debian.org/cgit/debian-astro/packages>
- IRC: <irc://irc.debian.org/debian-astro>



Thank you



debian
astronomy

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Debian Astro Team Uploaders

- Axel Beckert
- Vincent Hourdin
- Ben Keller
- Josue Ortega
- Vincent Prat
- Paul Sladen
- Roger Wesson
- Tomasz Buchert
- Filip Hroch
- Gijs Molenaar
- Thibaut Paumard
- Leo Singer
- Ole Streicher

