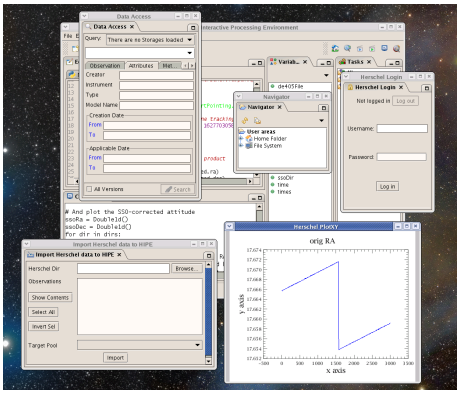
Read Me First

1. Welcome to HIPE!

Welcome to HIPE, the **H**erschel **I**ntegrated **P**rocessing **E**nvironment.



An integrated graphical environment

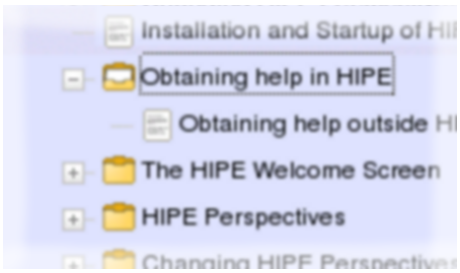
HIPE brings several applications together under a common, consistent interface. From data retrieval to plotting, from image analysis to scripting, powerful utilities are one click away.

From raw data fresh off the Herschel Archive to publication-ready plots, all you need to get science out of your observations.

The power of Java and Jython

HIPE is based on Java, one of the most popular programming languages. The multi-platform nature of Java allows HIPE to work flawlessly under Window, Mac OS and many Linux and UNIX flavours.

Jython is the Java-based version of Python, used worldwide for quick development of complex applications.



Help at your fingertips

Extensive documentation on HIPE is available for viewing in your web browser or printing in PDF format. Powerful search and bookmarking facilities will ensure you never get lost.

2. Why should I use HIPE?

There are several good reasons why HIPE is the best choice for reducing Herschel data. Here are a few we thought of:

- It was especially developed to handle Herschel data types!
- It includes all the routines you need to go from off-the-satellite data format to publication-ready results.
- It's the best place to develop your own reduction routines, thanks to the Jython language and the wealth of available functions.
- It is a modern and actively developed application. This ensures fast help and resolution of problems.

3. Where to go next

HIPE comes with tons of documentation, and you may feel a bit lost at first. Below are some helpful pointers to what you should read next.

- The **Quick Start Guide** will guide you through your first data reduction steps, from getting observations from the Herschel Science Archive to reducing them and analysing the results.
- The **Frequently Asked Questions** contain common issues and their solutions. Have a look here if you get stuck, you might be lucky and find an answer.
- The **What's New** lists all the new features since the last HIPE version. This document is now hosted on the Web, so you need an active Internet connection to access it.
- The **HIPE Owner's Guide** describes all the general features of HIPE.
- The **Herschel Data Analysis Guide** describes all the data analysis tools shipped with HIPE. The main emphasis is on graphical interface, but advanced sections cover command line interactions.
- **Scripting and Data Mining** is an advanced guide you should read if you want to develop your own scripts, or understand the internals of third-party scripts. It also describes some legacy software still used within the Herschel project.
- The **User Reference Manuals** contain information on many of the most used functions available in HIPE via the command line. There is one manual for the core software features, common to all instruments, plus three instrument-specific manuals for HIFI, PACS and SPIRE. Note that you will find the instrument-specific manuals only if you have the corresponding instrument software installed.

  Beware that these manuals are still in heavy development, and entries are of varying quality.
- The **Products Definitions Document** contains the definitions of all the *data products* used by the Herschel software. Products are the standard format for raw and reduced data.
- The **Developer's Reference Manuals**, together with the **API documentation** (also known as *Javadoc*) offer advanced information on the internals of the Herschel software for developers and expert users. You should not have to consult these document unless you are developing advanced scripts. However, you may have to look at the *API documentation* for features not yet covered by other guides. The *Scripting and Data Mining* guide contains instructions on how to use the API documentation.

  As with the User Reference Manual, there is one core manual plus three instrument-specific manuals for HIFI, PACS and SPIRE.

In addition, each instrument offers documentation on data reduction and analysis. Note that you will find these manuals only if you have the corresponding instrument software installed.

- **HIFI:**
  - The **HIFI User's Manual** is a document for all HIFI users giving descriptions in a *how to* format of HIFI specific tasks and tools, including the HIFI pipeline. Also other HIFI specific information such as flag values and (eventually) things learnt from PV. You are expected to look at the *Data Analysis Guide* before being able to follow this manual.
  - The **HIFI Pipeline Specification** describes each step of the pipeline in detail, discussing assumptions, mathematics, algorithms, and changes to the data. Not a beginner document, but useful if you are interested in modifying the HIFI pipeline or just learning more about it. First you should become more familiar with HIPE and Jython constructs.
- **PACS:**

  - In the **PACS Data Reduction Guide** you learn about the structure of PACS data, how to run the pipeline, how to inspect and understand the intermediate and final products. Also given are instructions about issues to consider for particular types of AOT and targets. It is the guide you follow to reduce your data from raw to science quality.

  - The **PACS Advanced User Manual** is the original PACS pipeline document. It has been written by and for internal users, and hence it will be, in places, difficult for general astronomy users to understand. However, the detailed pipeline descriptions (the task parameters and the algorithms) are explained here and these will be useful for general astronomy users to read. Consider this to be a reference document, where you look up the details for a pipeline task you want to know more about. If you are starting to work on your PACS data for the first time and want to learn how to run the pipeline, what order to run the tasks in, and how to check on the intermediate products, it is the PACS Data Reduction Guide that you should be reading.

- **SPIRE:**

  - The **SPIRE User's Manual** is an in-depth reference to the data processing pipelines for SPIRE photometry and spectroscopy data. Aimed at more advanced users who wish to exploit their data sets beyond the standard pipeline processing available through the Herschel Science Archive.

  - The **SPIRE Data User Manual** provides a comprehensive reference for all SPIRE users in terms of the data structures they will encounter when inspecting the different types of SPIRE observations. This manual is also as a guide on how to reprocess the data and inspect the products through the full SPIRE pipeline.