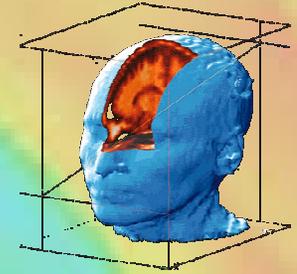


# HDF5 Tools in IDL<sup>®</sup>

Dr. Christopher Torrence  
Senior Software Engineer





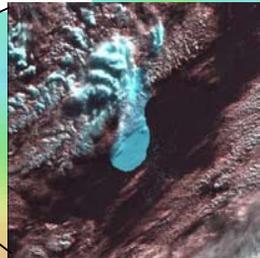
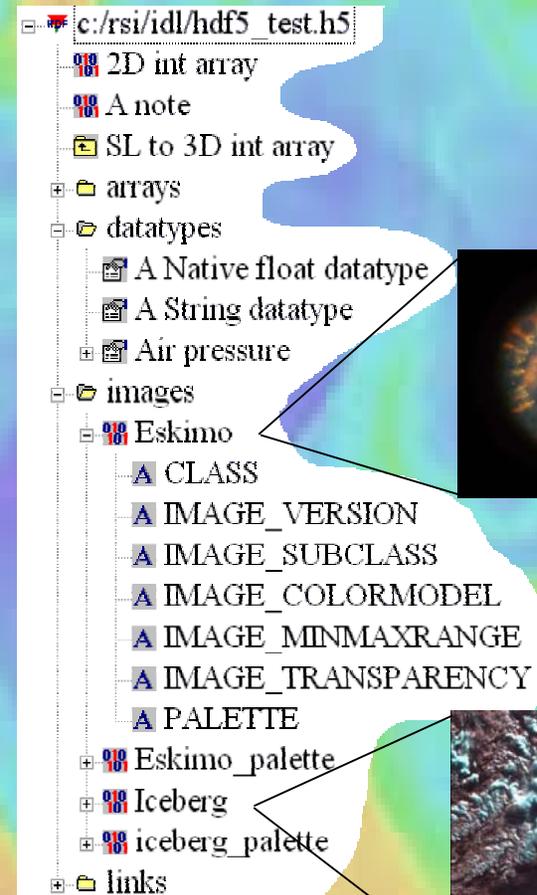
*The Interactive Data Language* is the ideal software for data analysis, visualization, and cross-platform application development. IDL combines all of the tools you need for "quick-look" interactive analysis or large-scale commercial projects.



- Interpreted vector-based language
- Built-in image processing, multi-threaded math, statistics, and analysis routines
- Object-oriented programming
- Read/write data formats such as PNG, JPEG, TIFF, DICOM, MrSID, HDF/HDF-EOS, NetCDF, XML
- Call from/to C/C++, FORTRAN, Java (with ION), ActiveX

# The IDL HDF5 Module

- Set of built-in IDL routines that provide access to the underlying HDF5 C library (version 1.4.3).
- Free with IDL5.6.
- All read and query routines except H5P.
- Routine names match the HDF5 C names, with an underscore, e.g. H5F\_OPEN
- Handles all HDF5 datatypes (including COMPOUND) except OPAQUE and VLEN; automatic conversion to IDL type
- Limitations:
  - No write capability
  - No high-level HDF5 API



# HDF5 Code Example

```
file_id = H5F_OPEN('hdf5_test.h5')
dataset_id1 = H5D_OPEN(file_id, '/images/Eskimo')
dataset_id2 = H5D_OPEN(file_id, '/images/Eskimo_palette')

space_id = H5D_GET_SPACE(dataset_id1)
dims = H5S_GET_SIMPLE_EXTENT_DIMS(space_id)
image = H5D_READ(dataset_id1)
rgb = H5D_READ(dataset_id2)

H5S_CLOSE, space_id
H5D_CLOSE, dataset_id1
H5D_CLOSE, dataset_id2
H5F_CLOSE, file_id

DEVICE, decomposed=0
WINDOW, xsize=dims[0], ysize=dims[1]
TVLCT, rgb[0,*], rgb[1,*], rgb[2,*]
TV, image, /ORDER
```



# High-level HDF5 Parser

The `H5_PARSE` function automatically parses an entire HDF5 file, or a group within a file, and returns a nested IDL structure.

```
IDL> struc=H5_PARSE('hdf5_test.h5',/READ_DATA)
```

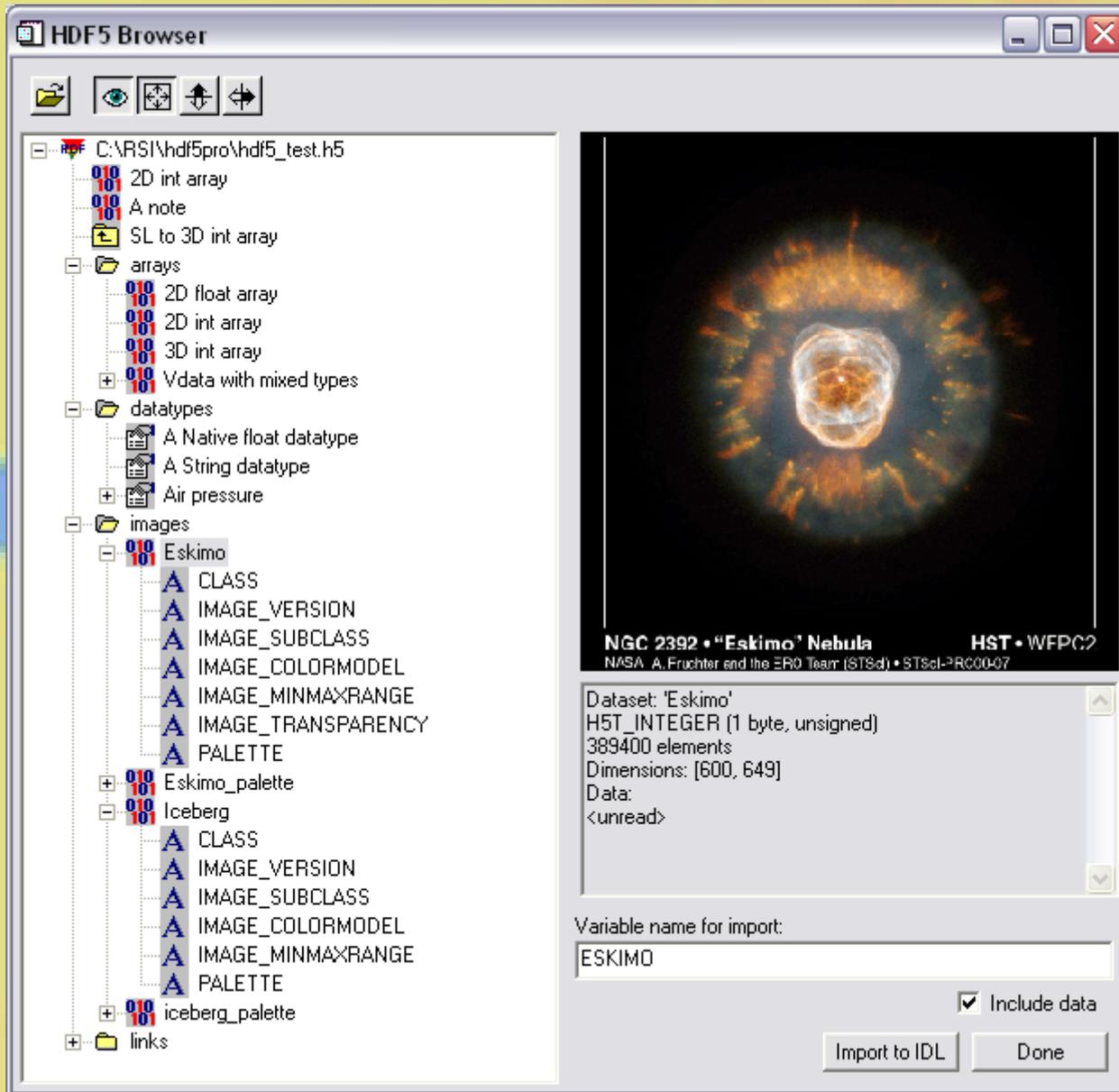
```
IDL> help, struc, /structure
```

```
IDL> help, struc.images.eskimo._data
```

Returns an IDL structure with tag names such as:

<code>_NAME</code>	<code>'hdf5_test.h5'</code>
<code>_TYPE</code>	<code>'GROUP'</code>
<code>_PATH</code>	<code>'/'</code>
<code>_COMMENT</code>	<code>'This is a comment'</code>

# The HDF5 Graphical Browser



- Uses H5\_PARSE
- Tree view
- Preview window
- Import to IDL main level
- Creates IDL structure
- Standalone or as “open” dialog

# What's New in IDL5.6

- LAPACK linear algebra package.  
Linear equations, eigensystems, singular value decomposition, linear least-squares
- DIAG\_MATRIX, MATRIX\_POWER, PRODUCT
- Complex gamma, beta, and error functions
- MEDIAN Dimension keyword
- Stride for array subscripts
- New widgets: tree view, tab view, combo boxes, tooltips, toggle buttons
- Support for 64-bit IBM AIX, SGI Irix, HP-UX
- Support for MacOS X
- USGS General Cartographic Transformation Package (GCTP)
- Map transform functions
- HDF5 library read & query
- HDF4.1r5 and HDF-EOS 2.8
- XML parser
- ITIFF support
- Contour object labels

**Download IDL5.6 & the HDF5 library from <http://www.rsinc.com>  
Visit us at booth #104 in the Exhibit Hall!**