



## Why use the WWW as an interface ?

- 1) Programs remain on local computers - easy to update
- 2) Programs run on any computer - Mac, PC, Unix...
- 3) User-friendly GUI & on-line help
- 4) Modernise old fortran applications
- 5) Control user access - only authorized users allowed



# What programs work with WWW ?

- 1) Programs that read just a few parameters
- 2) Programs that use data files.
- 3) Programs that use a CLI - Command Line Interface.
- 4) Programs that use Command Line Parameters
- 5) Any combination of the above

..... This covers just about everything !!!



# What programs DON'T work with WWW?

## 1) Programs that use an **INTEGRATED GUI (& no CLI)**

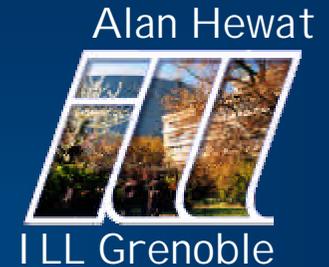
(Note for programmers – keep GUI separate from remaining code)

## 2) **Spaghetti coded CLI – random questions to the user**

(Note – program modular – even if you don't have a GUI now)

..... **Because they will not accept packaged input**

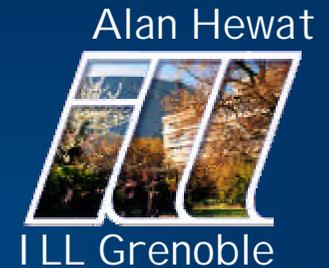
# Simple or Sophisticated ?



Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications

# Simple or Sophisticated ?



Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications



# How does "Simple" work ?

1) Create an WWW form to take input from the user.

A screenshot of a web form. On the left, the text "Ask me a Question !" is displayed. To its right is a text input field containing the text "What time is it ???". Further to the right is a button labeled "Ask".

The **INPUT** from the **FORM** is posted to CGI script `"/cgi-bin/answer"`



## How does "Simple" work ?

### 2) Create a CGI script `"/cgi-bin/answer"` (Unix example)

This **CGI script** just reads the variable `$input` from the WWW form, and runs a simple Fortran program `"fortrantime"` that calls function `"fdate()"`

### 3) Your useful old Fortran program to be modernized



## 3 Components of a "Simple" WWW-GUI

- 1) Create an WWW form to take input from the user.
- 2) Create a CGI script `"/cgi-bin/answer"` (Unix example)
- 3) Your useful old Fortran program to be modernized
- 4) Add links to help files to make life easy for novices



# 3 Components of a "Simple" WWW-GUI

Old Fortran CLI



The CLI dialogue in the old CRYSTIN search engine for ICSD



# A "Simple" WWW-GUI

<u>Authors</u> <input type="text"/>	<u>Years</u> <input type="text"/>	<u>Remarks</u> <input type="text"/>	<u>S.String</u> <input type="text"/>	<u>Help</u> <input type="button" value="Go"/>
<u>Elements</u> y1 ba2 cu3	<u>Ele.Count</u> <input type="text"/>	<u>Mineral N.</u> <input type="text"/>	<u>Jrnl Coden</u> <input type="text"/>	<u>ANX Form</u> <input type="text"/>
<u>Laue class</u> any ▾	<u>System</u> any ▾	<u>Space Gp.</u> <input type="text"/>	<u>Cell vol</u> <input type="text"/>	<u>Pearson S.</u> <input type="text"/>
<u>Z unit/cell</u> <input type="text"/>	<u>Min.dist.</u> <input type="text"/>	<u>Dist.Select</u> <input type="text"/>	<u>Dist.Range</u> <input type="text"/>	<u>Co-ordin</u> <input type="text"/>

Full Database, 21-July-2000 with 53372 Entries. [Help&News](#)  
Expert Query `find (ele=y1 and ba2 and cu3 and o7) ;`  
61 selected.

WWW-GUI form

Help Links

Actual CLI Query

Simple WWW-GUI interface to I CSD [barns.ill.fr/dif/icسد/](http://barns.ill.fr/dif/icسد/)

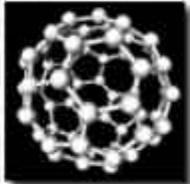


# A "Simple" WWW-GUI

A screenshot of a Microsoft Internet Explorer browser window. The title bar reads "ICSD for WWW Help: Element names - Microsoft Internet Explorer". The address bar shows "http://barns.ill.fr/dif/icso/elements.html". The main content area displays a page titled "The ELE (Elements) descriptor class" with a molecular structure icon. Below the title, there is explanatory text and a list of search criteria. An orange arrow points from the text "Help Links" to the right side of the page content. At the bottom of the page, there are buttons for "List\_Entries", "Endnote", "References", and "Export\_All", along with the text "61 selected.".

ICSD for WWW Help: Element names - Microsoft Internet Explorer

Address <http://barns.ill.fr/dif/icso/elements.html>



## The ELE (Elements) descriptor class

This is one of the most useful search criteria. Entering eg **Al O** specifies *all* compounds containing **Al and O**. If you want just **Al<sub>2</sub>O<sub>3</sub>**, you should as well specify an element count of **2**, or perhaps elements **Al<sub>2</sub> O<sub>3</sub>** (note the separating space!)

- keyword = [element symbol]. Examples: **Fe, I**
- keyword = [symbol for a group of elements] Examples: **HAL** or **ALK** or **HAL**

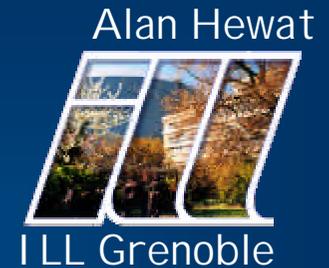
Done Local intranet

61 selected.

Help Links

Simple WWW-GUI interface to ICSO [barns.ill.fr/dif/icso/](http://barns.ill.fr/dif/icso/)

# Simple or Sophisticated ?

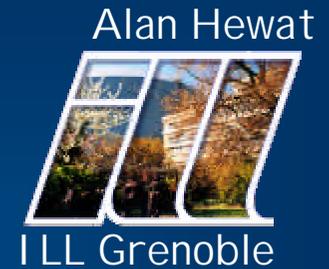


Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications

# The value of PERL [www.perl.com](http://www.perl.com)

PERL = Practical Extraction and Report Language



1) A simple scripting language that works on **all computers**

2) Powerful for text/string manipulation (HTML output)



# The value of PERL [www.perl.com](http://www.perl.com)

[I CSD-for-WWW  
barnes.ill.fr/dif/icsd/](http://www.barnes.ill.fr/dif/icsd/)

Full Database, 21-July-2000 with 53372 Entries. [Help&News](#)  
Expert Query: find (ele=y1 and ba2 and cu3 and o7);  
61 selected. [List\\_Entries](#) [Endnote](#) [References](#) [Export All](#)

Beech,F. Miraglia,S. Santoro,A. Roth,RS. (1987) Phys.Rev.B,Condens.Mat **35** ISSUE 16 8778-8781  
**Neutron study of the crystal structure and vacancy distribution in the superconductor Ba2YCu3O9-d**

Beech,F. Miraglia,S. Santoro,A. Roth,RS. (1987) Phys.Rev.B,Condens.Mat **35** ISSUE 16 8778-8781  
**Neutron study of the crystal structure and vacancy distribution in the superconductor Ba2YCu3O9-d**

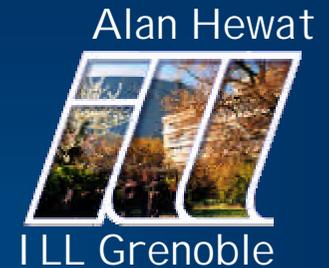
Calestani,G. Rizzoli,C. (1987) Nature (London **328** 606-607  
**Crystal structure of the Y Ba2 Cu3 O7 superconductor by single X-ray diffraction**

Hazen,RM. Finger,LW. Angel,RJ. Prewitt,CT. Ross,NL. Mao,HK. Hadjidiacos,CG. Hor,PH. Meng,RL. Chu,CW. (1987) Phys.Rev.B,Condens.Mat **35** 7238-7241  
**Crystallographic description of phases in the Y-Ba-Cu-O superconductor.**

Search the Database  Local intranet

PERL used to print formatted references

# Simple or Sophisticated ?



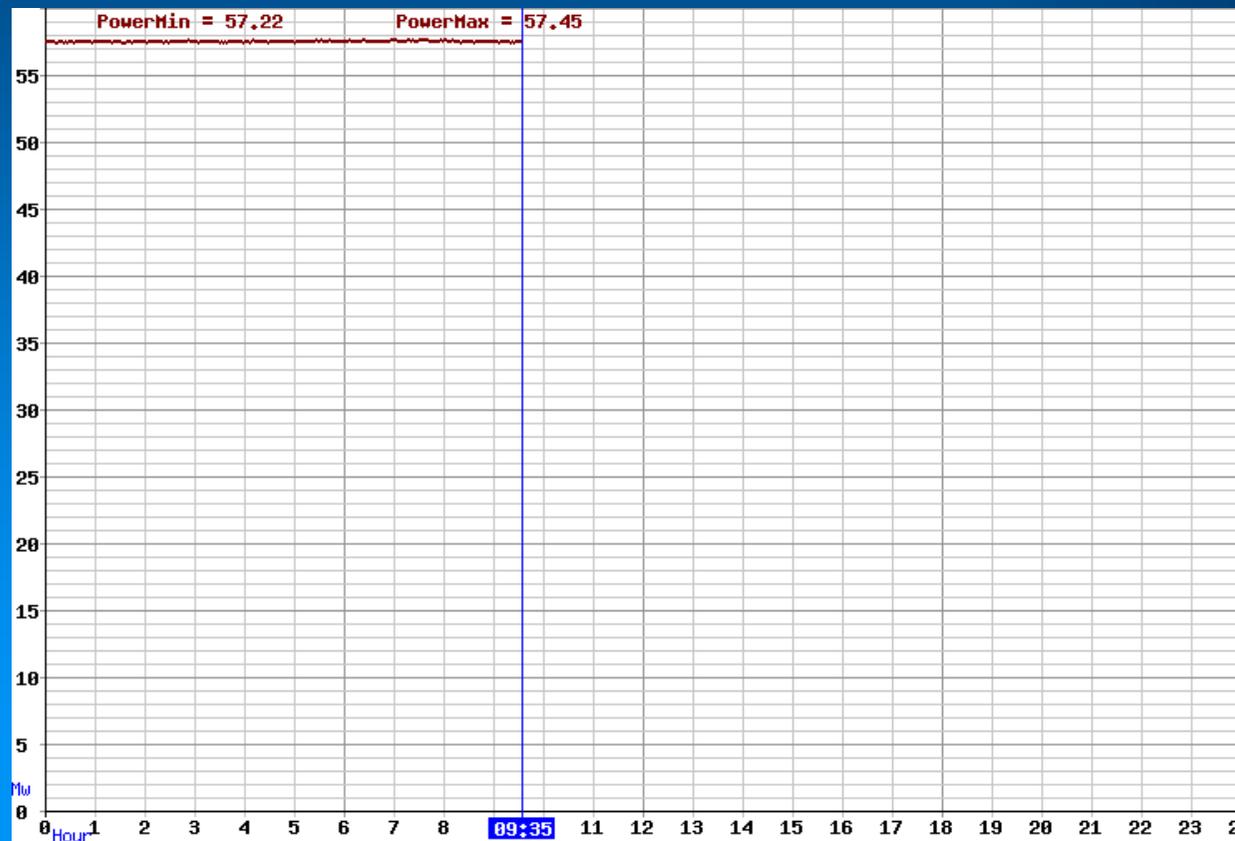
Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications



# Dynamically generated WWW data plots

The WWW server plots data and outputs GIF image files eg using PGPLOT



ILL reactor power. GIF plot automatically updated every 15 minutes

Fabien Pinet, ILL

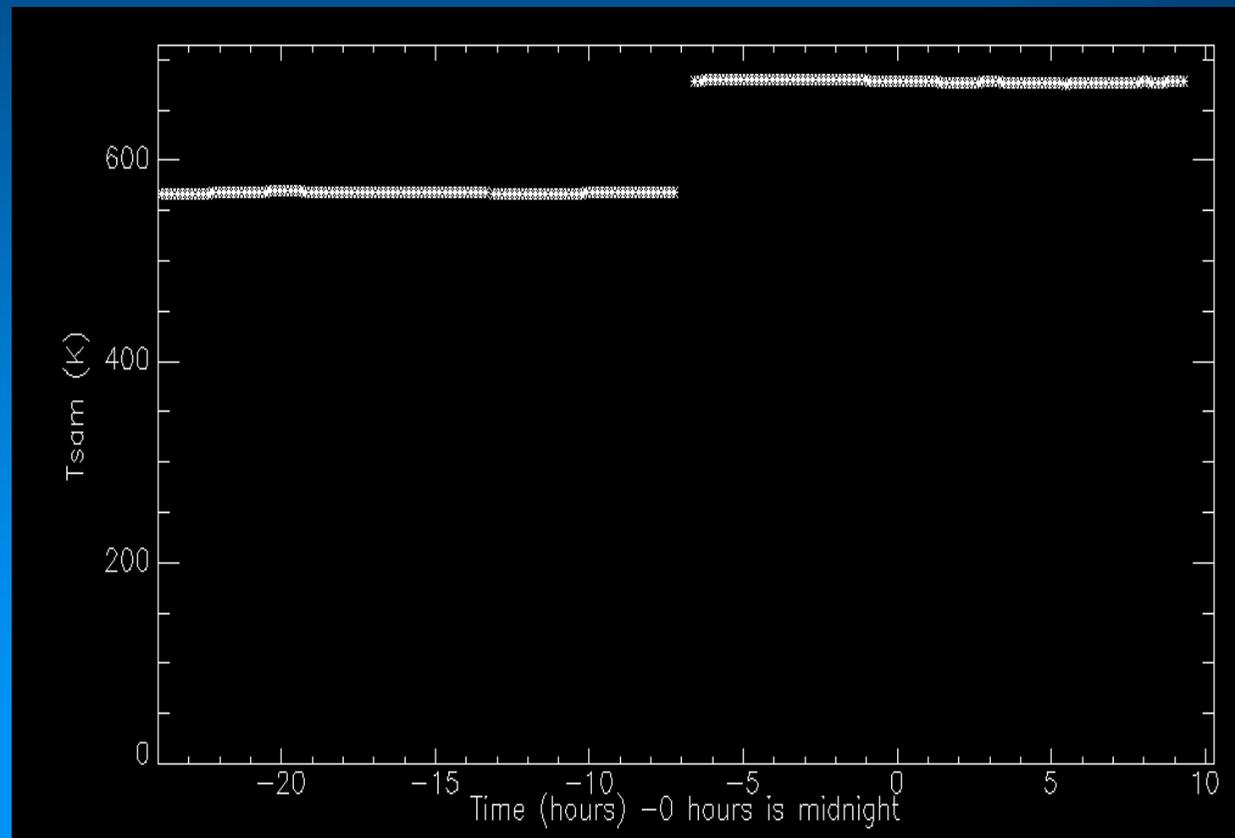
Alan Hewat



ILL Grenoble

# Dynamically generated WWW data plots

The WWW server plots data and outputs GIF image files using eg PGPLOT



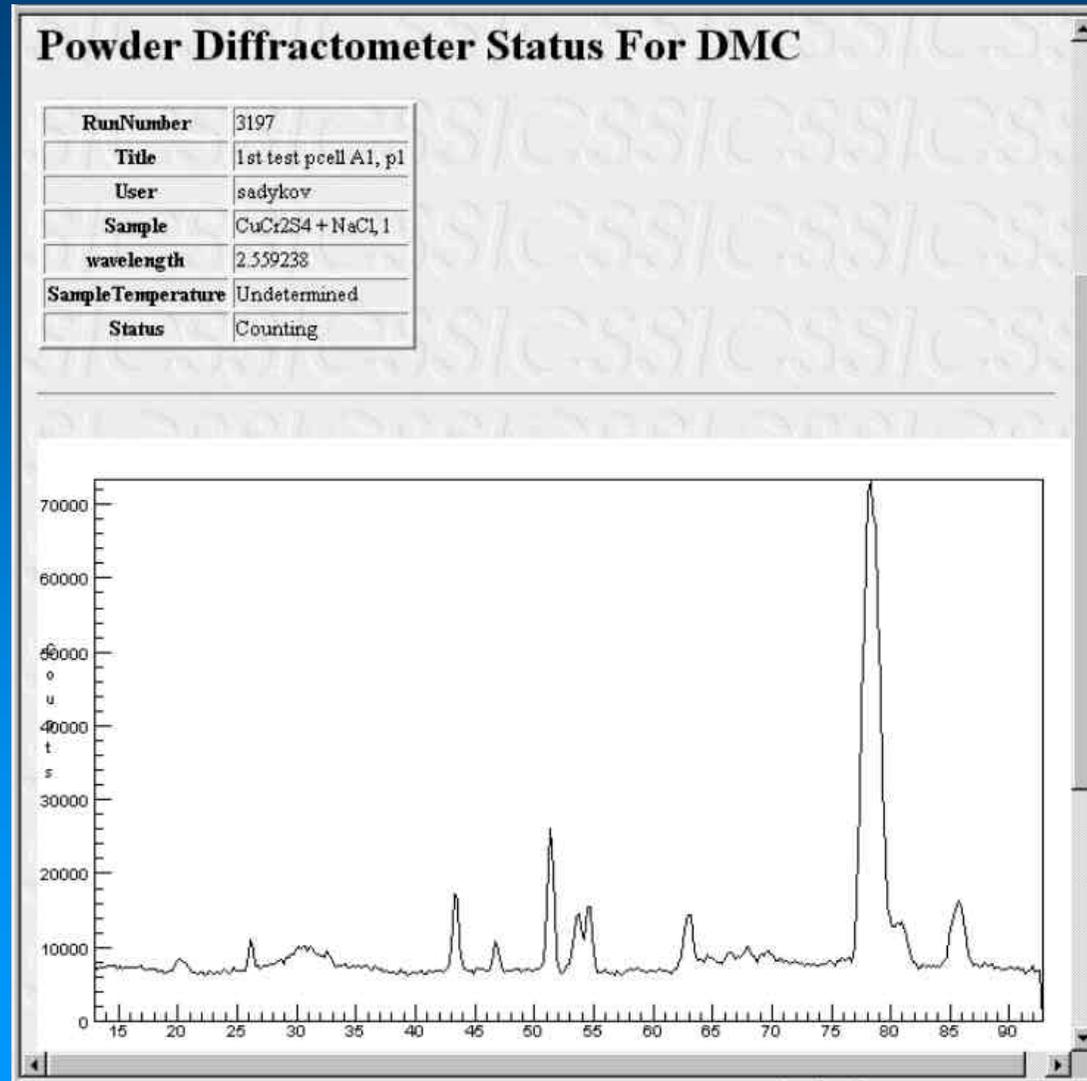
**D7 diffractometer sample Temperature.** GIF plot updated on demand.

Ross Stewart, ILL

ECM-19, Nancy, August 2000



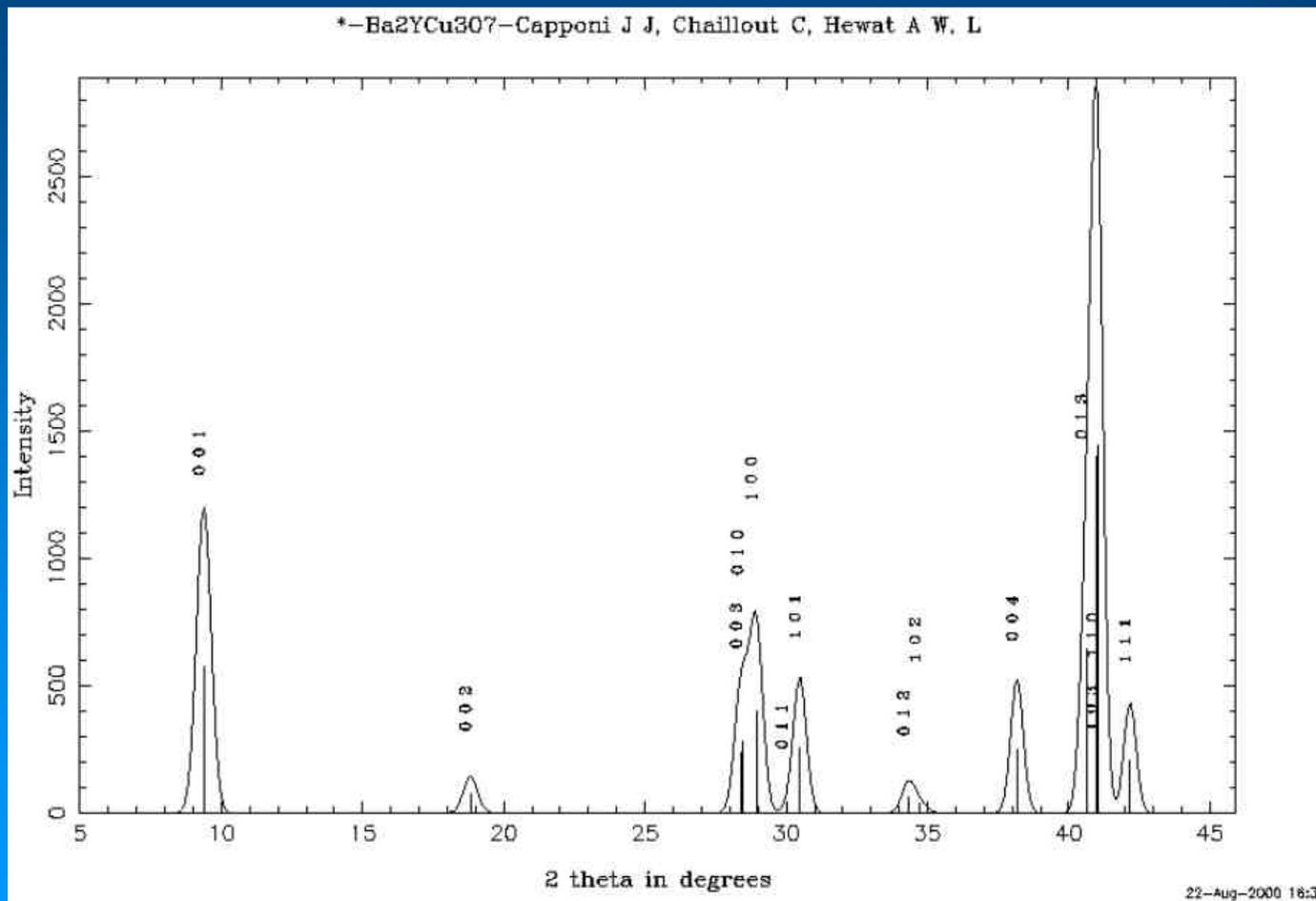
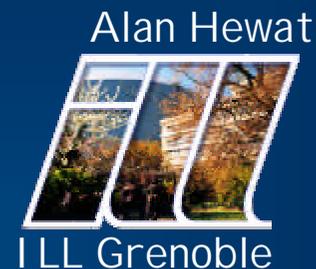
# Dynamically generated WWW data plots



Real-time display in Grenoble  
of Swiss diffractometer DMC

# Dynamically generated WWW postscript

High resolution printout or display



Lazy Pulverix generates postscript plots [barns.ill.fr/dif/icsd/](http://barns.ill.fr/dif/icsd/)

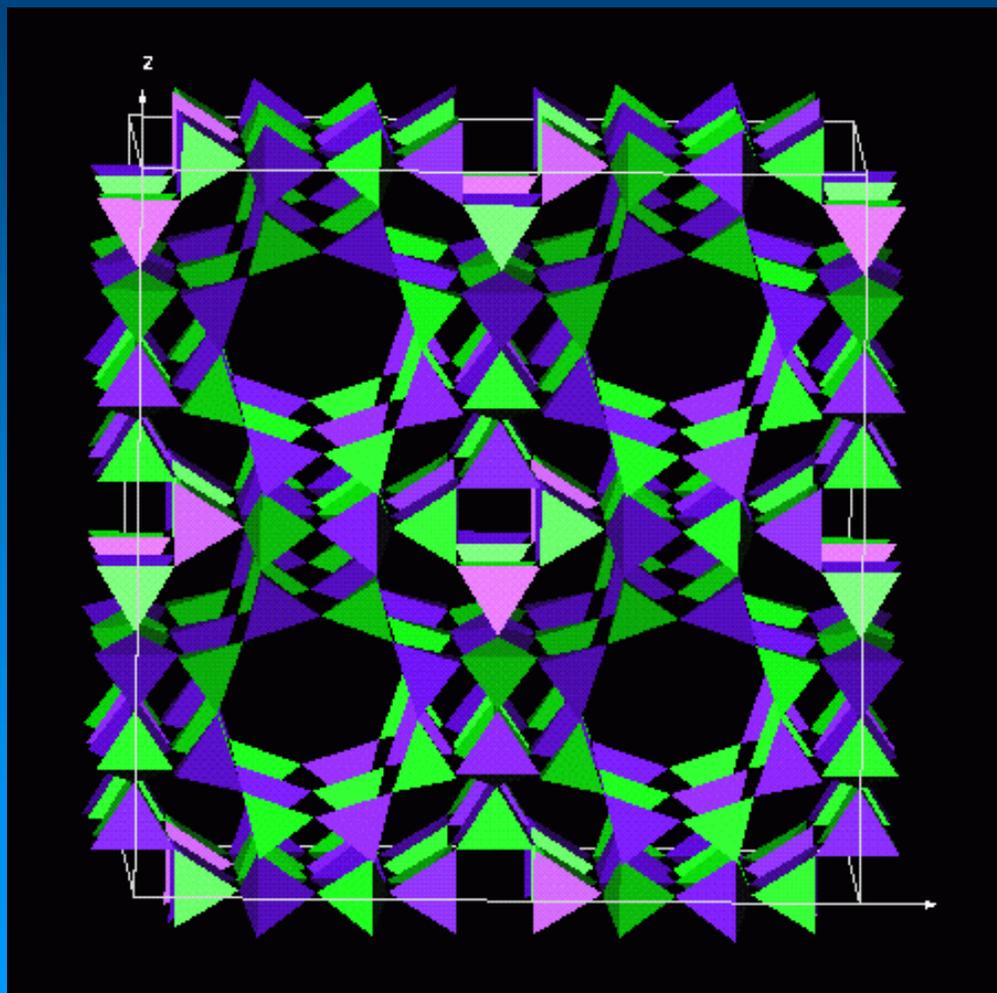
ECM-19, Nancy, August 2000

# Dynamically generated 3D VRML

Alan Hewat



ILL Grenoble



VRML is a general 3D format  
for WWW use

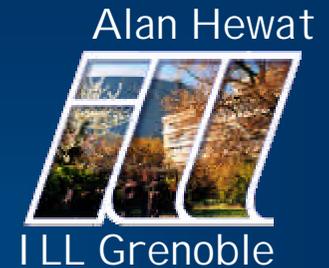
[Show me](#)



Xtal-3d generates VRML crystal structures [barns.ill.fr/dif/icsd/](http://barns.ill.fr/dif/icsd/)

ECM-19, Nancy, August 2000

# Simple or Sophisticated ?



Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications

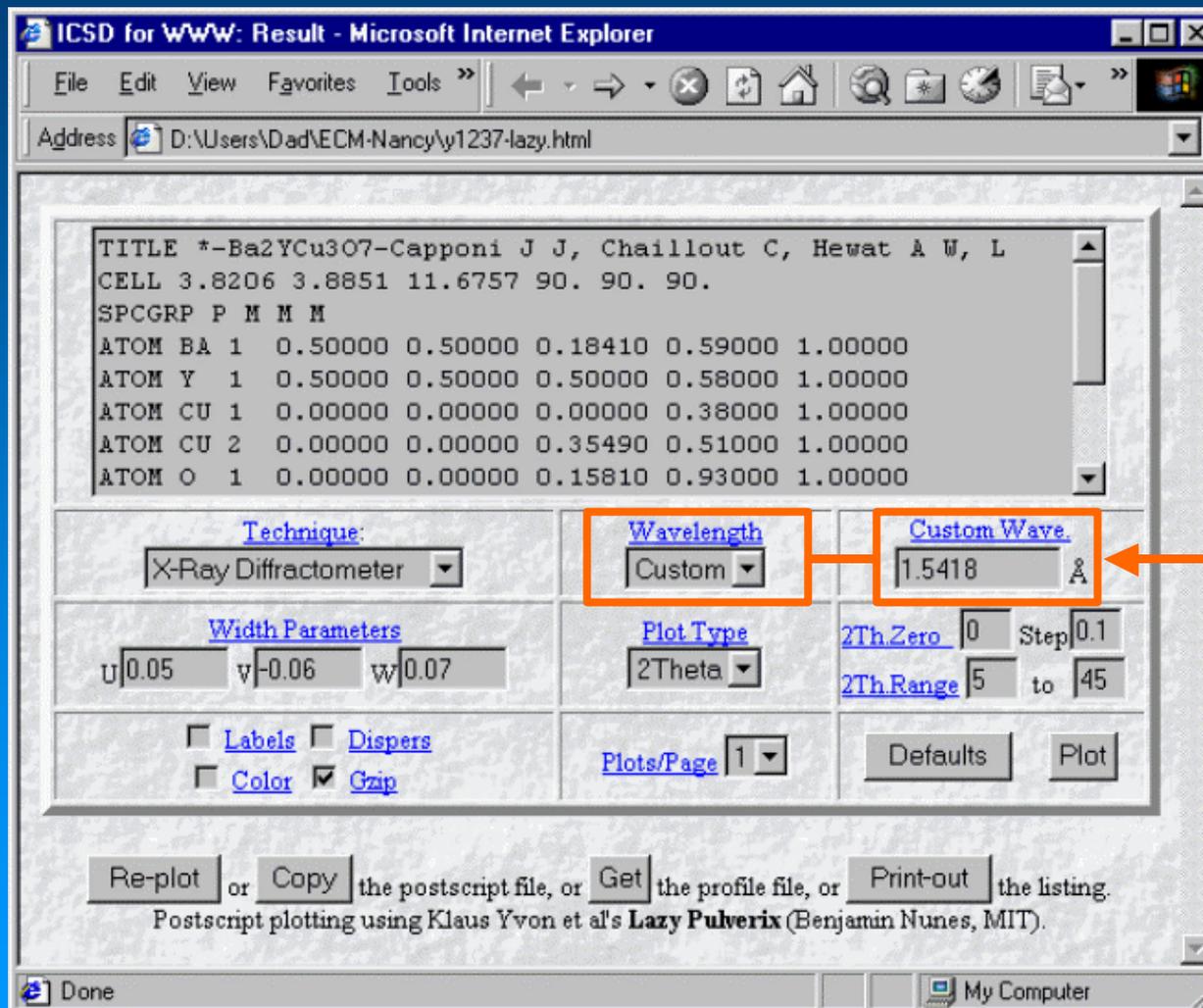
# Javascript for interactive WWW-GUI

Alan Hewat



Lazy PulverIx uses Javascript on [barns.ill.fr/dif/icsd/](http://barns.ill.fr/dif/icsd/)

# Javascript for interactive WWW-GUI

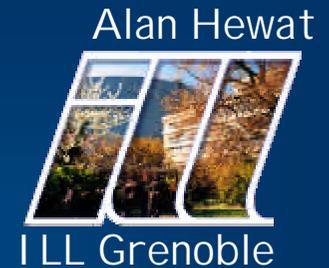


JAVASCRIPT used to select precise wavelength

Show me →

Lazy Pulverix uses Javascript on [barns.ill.fr/dif/icsd/](http://barns.ill.fr/dif/icsd/)

# Simple or Sophisticated ?



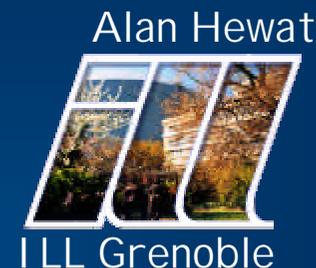
Available techniques range from simple to sophisticated.

- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications

<http://barns.ill.fr>

# JAVA applets monitor/control machines

## D3 diffractometer operation monitor.



**D3 Status**  
Version 3.0.6 - 24.03.00

User: **EddyLB**  
Sample: **CoFe**

Input Stream:  
**None**  
**None / None**

Output file:  
**cofe04**  
**125 lines**

\*bof 1  
**0.00 0.00 2.00**

Time: **10.0 s**  
Rate: **Unknown**  
R: **Unknown**  
dR: **Unknown**  
Server is alive.

**Primary Spectrometer**  
Monochromator: **Heusler** Wavelength: **0.7360 Å** Filter: **Empty**  
Omega: **6.09 deg** Theta: **12.17 deg** Chi: **0.07 deg**  
HFR: **57 MHz** Shutter: **Ch:R4A Closed Mode: Automatic**  
Polar Up: **0.9400+/-0.0010** Polar Down: **-0.9400+/-0.0010**

**Secondary Spectrometer**  
Half-Shutter: **None** Sample Temp: **Unknown** Field: **Unknown**  
Omega: **-209.60 deg** Gamma: **-89.99 deg** Nu: **0.29 deg** Phi: **-87.72 deg**

**Cryoflipper** **Cryomagnet**  
LN2: **70%** LN2: **Unknown**  
LHe: **45%** LHe: **Unknown**

**Cold Valve** **VII**  
Set Point: **0.5 mbar** Power: **0 s** Reg. Temp: **Unknown**  
Pressure: **Unknown** Mode: **Automatic** Reg. Heater: **Unknown**

**File Photo Help Halt** Mad Status @ **29-Aug-00 16:19:58**  
MAD is active Cryo Status @ **29-Aug-00 15:57:22**

Java graphic monitor  
for cryogenic levels,  
temperature etc

The server downloads JAVA code to run on the local WWW browser

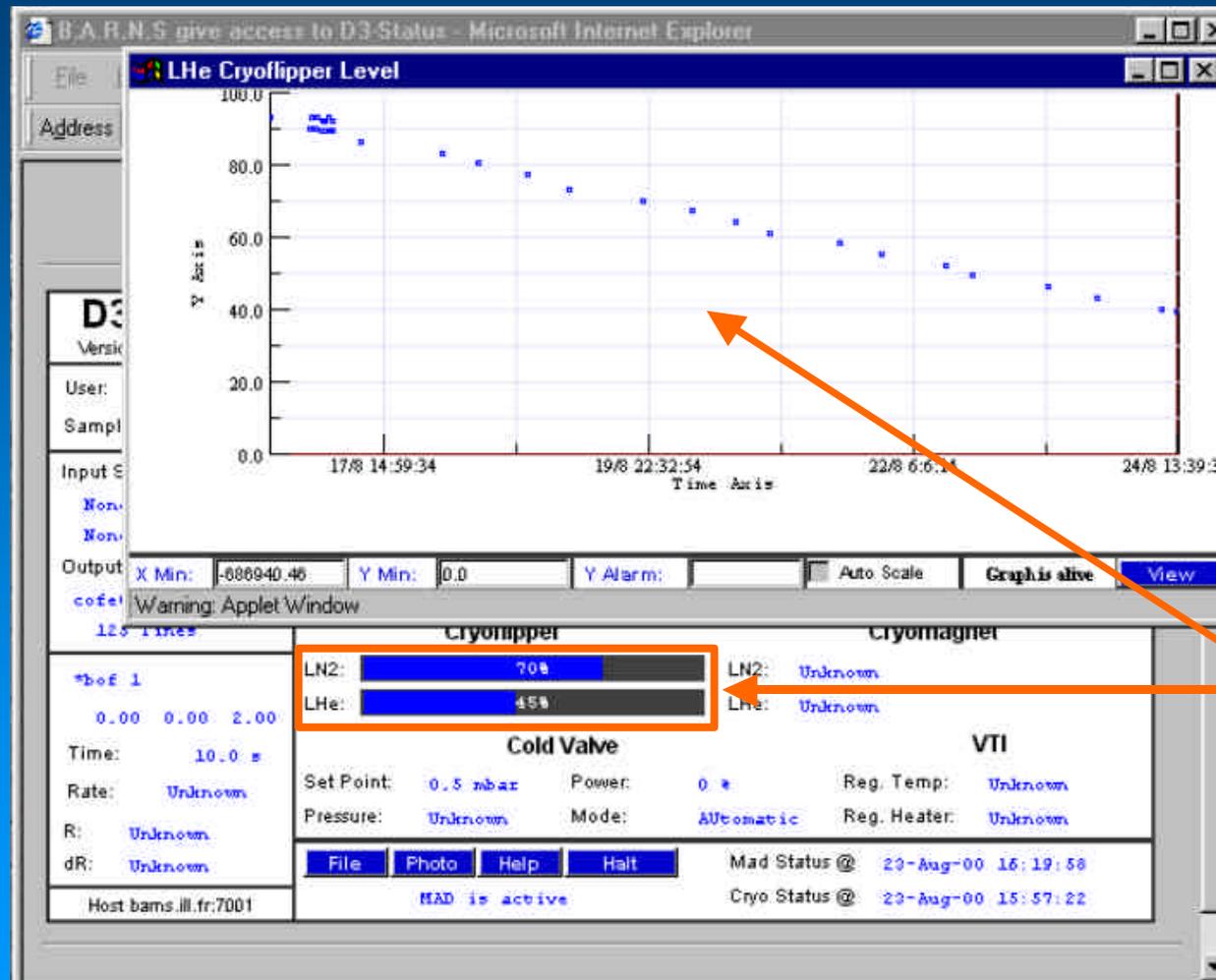
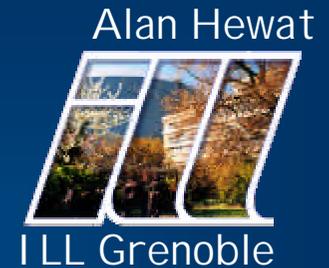
Marcel Portes de Albuquerque & Eddy Lelievre, ILL

ECM-19, Nancy, August 2000

<http://barns.ill.fr>

# JAVA applets monitor/control machines

## D3 diffractometer operation monitor.



Java graphic monitor for cryogenic levels, temperature etc

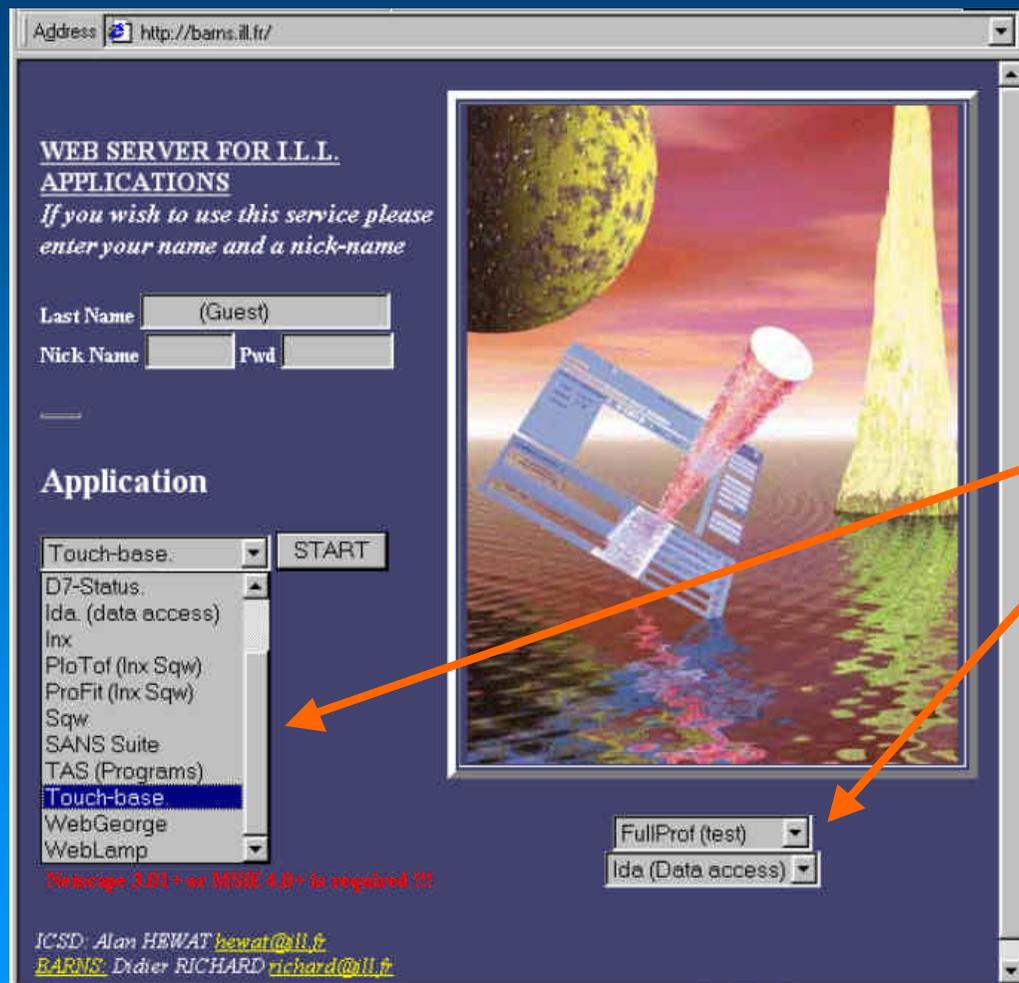
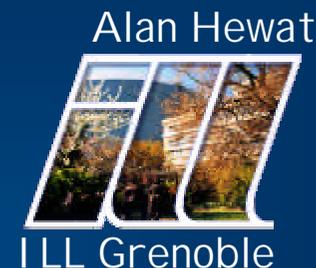
The server downloads JAVA code to run on the local WWW browser  
Marcel Portes de Albuquerque & Eddy Lelievre, ILL

ECM-19, Nancy, August 2000

http://barns.ill.fr

# JAVA applets monitor/control machines

## General ILL WWW diffractometer monitor



Large choice of Java and other applications

The server downloads JAVA code to run on the local WWW browser

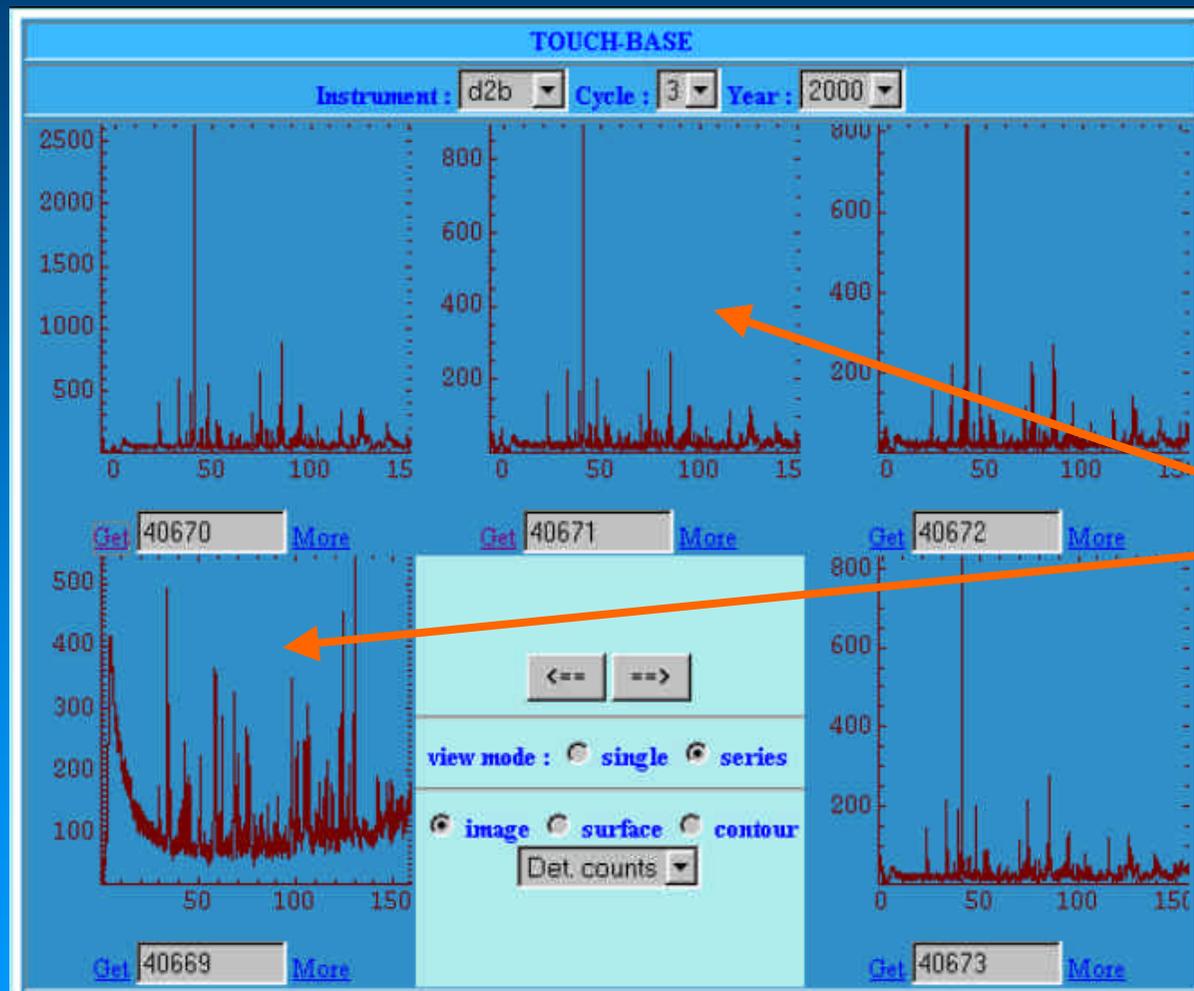
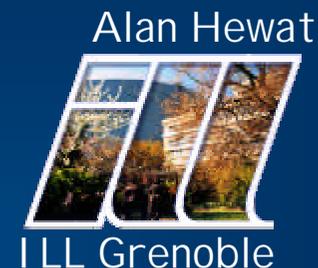
Didier Richard, ILL

ECM-19, Nancy, August 2000

<http://barns.ill.fr>

# JAVA applets monitor/control machines

## ILL TouchBase diffractometer monitor for D2B



Series of D2B powder diffraction patterns

The server downloads JAVA code to run on the local WWW browser

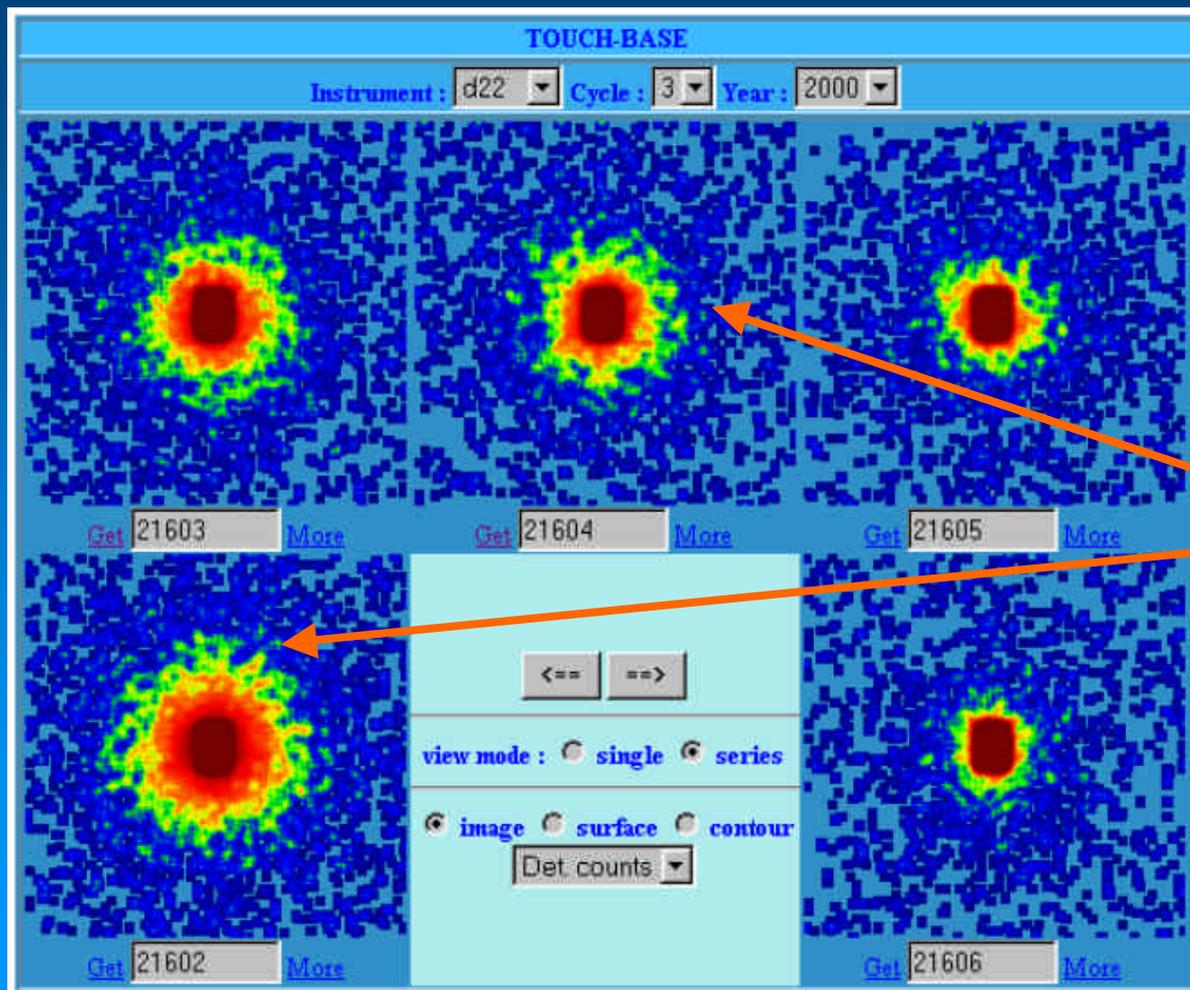
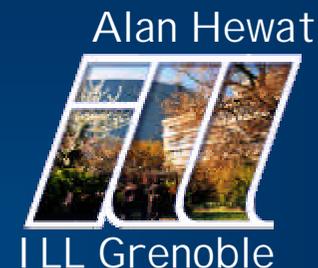
Didier Richard, ILL

ECM-19, Nancy, August 2000

<http://barns.ill.fr>

# JAVA applets monitor/control machines

## ILL TouchBase diffractometer monitor for D22



Series of D22 SANS diffraction patterns

The server downloads JAVA code to run on the local WWW browser

Didier Richard, ILL

ECM-19, Nancy, August 2000

<http://Ins00.psi.ch/>

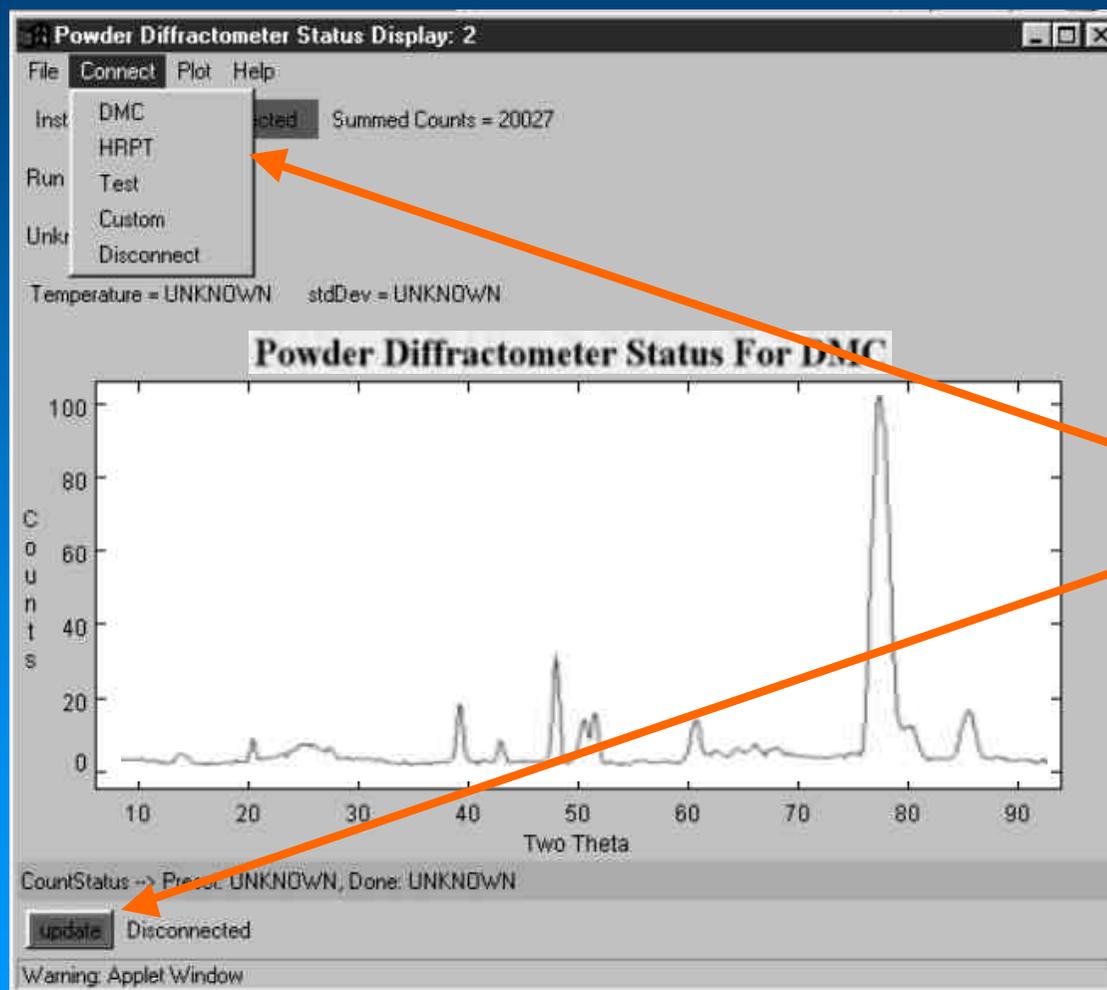
# JAVA applets monitor/control machines

## Swiss PSI diffractometer operation

Alan Hewat



ILL Grenoble

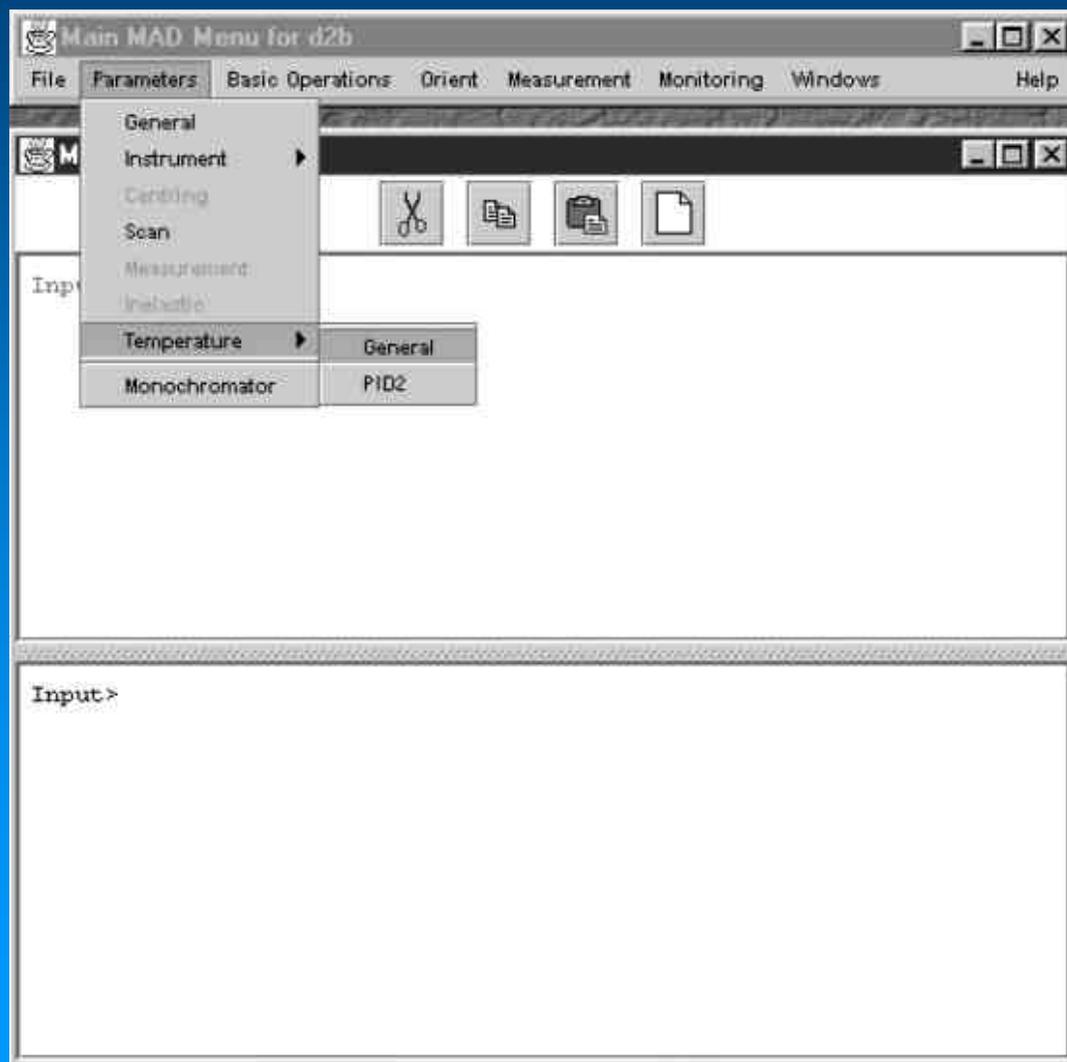
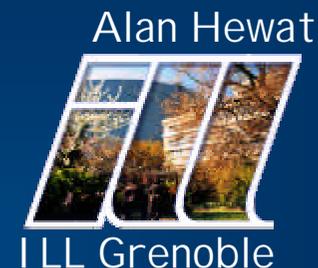


Automatic or manual  
update every ~ seconds

Dynamic display of powder patterns.  
Mark Koennecke, PSI

# JAVA applets monitor/control machines

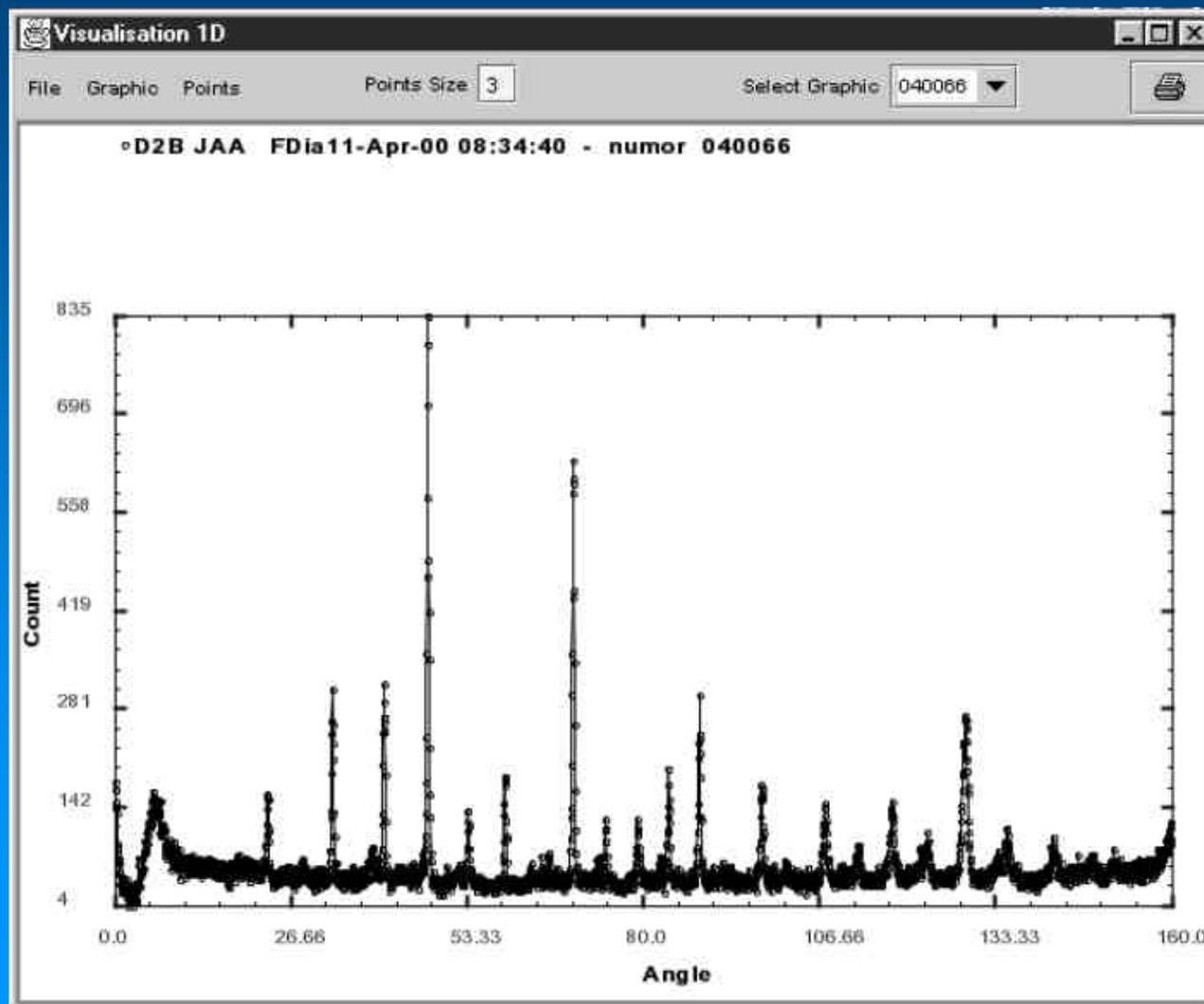
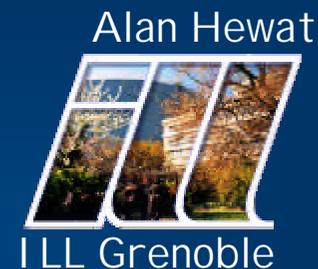
## ILL General diffractometer control application



- Menus and parameters are read from simple text files
- Auto grayed out menu items not applicable in this case (eg no centering for powders)

# JAVA applets monitor/control machines

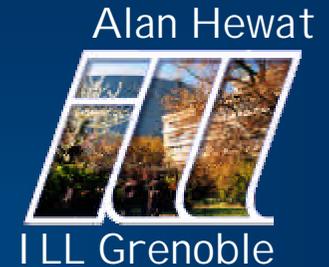
## ILL General 1D/2D/3D plot application



- Multiple colored plots
- Change of scale etc...

Show me

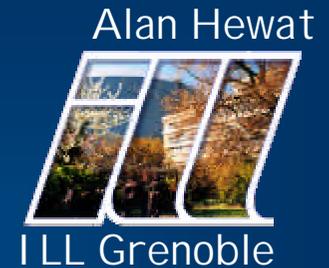
# Simple or Sophisticated ?



Available techniques range from simple to sophisticated.

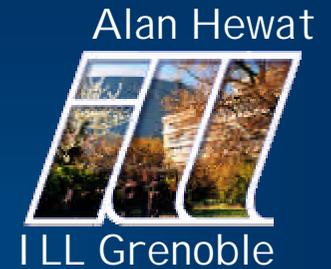
- 1) Old **fortran** programs plus **simple HTML**
- 2) More sophisticated but still easy **PERL CGI scripts**
- 3) Dynamic **creation of GIF, VRML** and other plot files
- 4) **Javascript** additions to make HTML forms **interactive**
- 5) **Java** applets as local GUI's to remote applications

# Simple or Sophisticated ?



- 1) **Simple HTML** will already provide a useful **GUI**
- 2) Basic **PERL CGI scripts** will eventually be needed
- 3) Dynamic **creation of GIF** is relatively fast & easy
- 4) **Javascript** additions require a bit more work
- 5) **Java applets** are for **experts**, and are **rather slow**  
(but Java interpreters & computers will get faster)

# Why use the WWW as an interface ?



It's easy and makes life easy for users