e – Ciencia
y el Programa de Estudios de Física

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nunez@ula.ve
Centro de Física Fundamental
Departamento de Física, Facultad de Ciencias

Nuevos Paradigmas, Nuevas Realidades, Una Revolución Informacional.

- **Nuevo modo de producción Capitalista**
  - *Cambio de los procesos implica cambios más allá de las TIC*
  - *De la Economía Industrial a la Economía Informacional*
  - *De los bienes materiales a los Servicios*
  - *Conocimiento Materia Prima para Producir Conocimiento*
- **La Economía Informacional**
  - *Global: Procesos de Escala Mundial en Tiempo Real.*
  - *Las economías nacionales se convierten en estrategia nacional.*
  - *Funciona en Red interdependiente*
  - *Requiere RR.HH. Altamente capacitados y creativos*
- **Nueva Cultura Científica e-ciencia**
  - *Teoría - Experimentos - Simulación*
  - *Multidisciplinaria & Colaboración Remota*
  - *Medición y Minería de Datos.*

Esta Revolución va en Serio:
Tendencias en la Información (2002)

- ~ **5 ExaByte de nueva información**
  - Exa = 10^{18}, Peta = 10^{15}, Tera = 10^{12}, Giga = 10^{9}, Mega = 10^{6}, Kilo = 10^{3}
  - **Biblioteca Congreso ~ 100 Tera**
- 92%HH; 7%película; 0,01 impresa; 0,002 óptica
- ~800 MB/año/persona; 30%incremento anual
- Información Dinámica 18 Exa en tránsito ~ 3,5 veces almacenada
  - **Teléfono** 17,3 Exa; **e mail** 400 Peta; **TV** 70 Peta; **Radio** 3,5 Peta; **SMS- Messanger** 300 Tera; **WWW** 170 Tera; **P2P Video, MP3**
  - **Teléfono** 15 h/mes; **Radio** 90 h/mes; **TV** 131 h/mes **INTERNET** 100 (25 + 75) h/m
- Incremento **Información Impresa Burocrática**
- Almacenamiento Magnético es El Medio
- WEB Superficial ~ 1/3 WEB Profundo

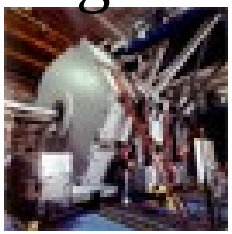
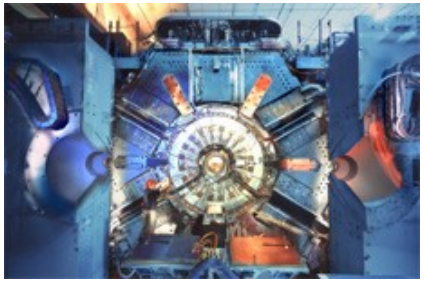
http://www.sims.berkeley.edu/how-much-info/
http://www.sims.berkeley.edu/research/projects/how-much-info-2003/

Ciencia/ Arte, Ciencia Industrial, e- Ciencia

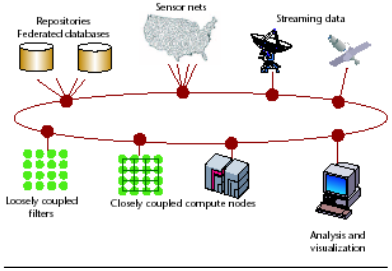
- **Ciencia Arte:** Esfuerzo, ingenio y destrezas personales

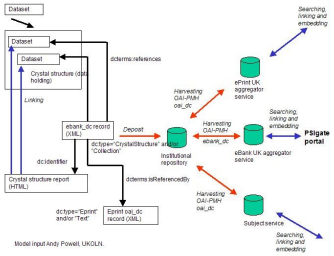
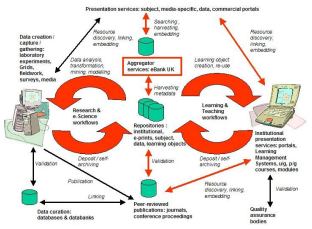


- **Ciencia Industrial:** Esfuerzo Colectivo, destrezas e ingenio tecnológico

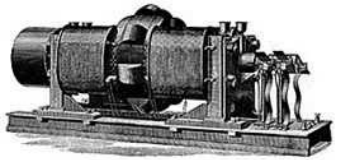




- **e- Ciencia:** Esfuerzo Global, destrezas e ingenio info

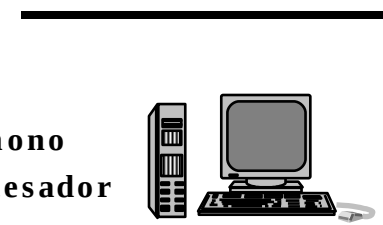


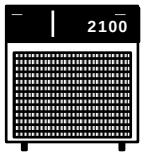
Distribución y penetración de la electricidad en nuestras vidas replica el proceso de distribución y penetración de la información



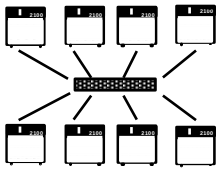
3. Brush arc-lighting dynamo, 1882



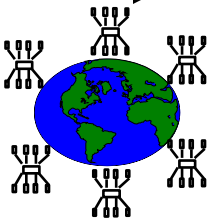
mono Procesador



Memoria Compart



Cluster Paralelo local



Cluister Paralelo Universal

Computación es un servicio e implica un *outsourcing*
Zapatero a sus Zapatos

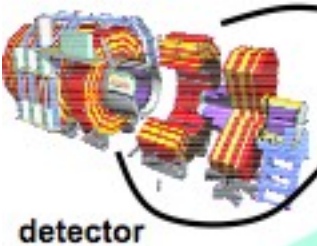
e-Science and the Grid

'e-Science is about global collaboration in key areas of science, and the next generation of infrastructure that will enable it.'

John Taylor
Director General of Research Councils
Office of Science and Technology

http://www.ecs.soton.ac.uk/~ajgh/AssissiGridTalk.pdf

Data Handling and Computation for Physics Analysis



detector

event filter (selection & reconstruction)

reconstruction

raw data

event summary data

processed data

event reprocessing

batch physics analysis

analysis

analysis objects (extracted by physics topic)

event simulation

simulation

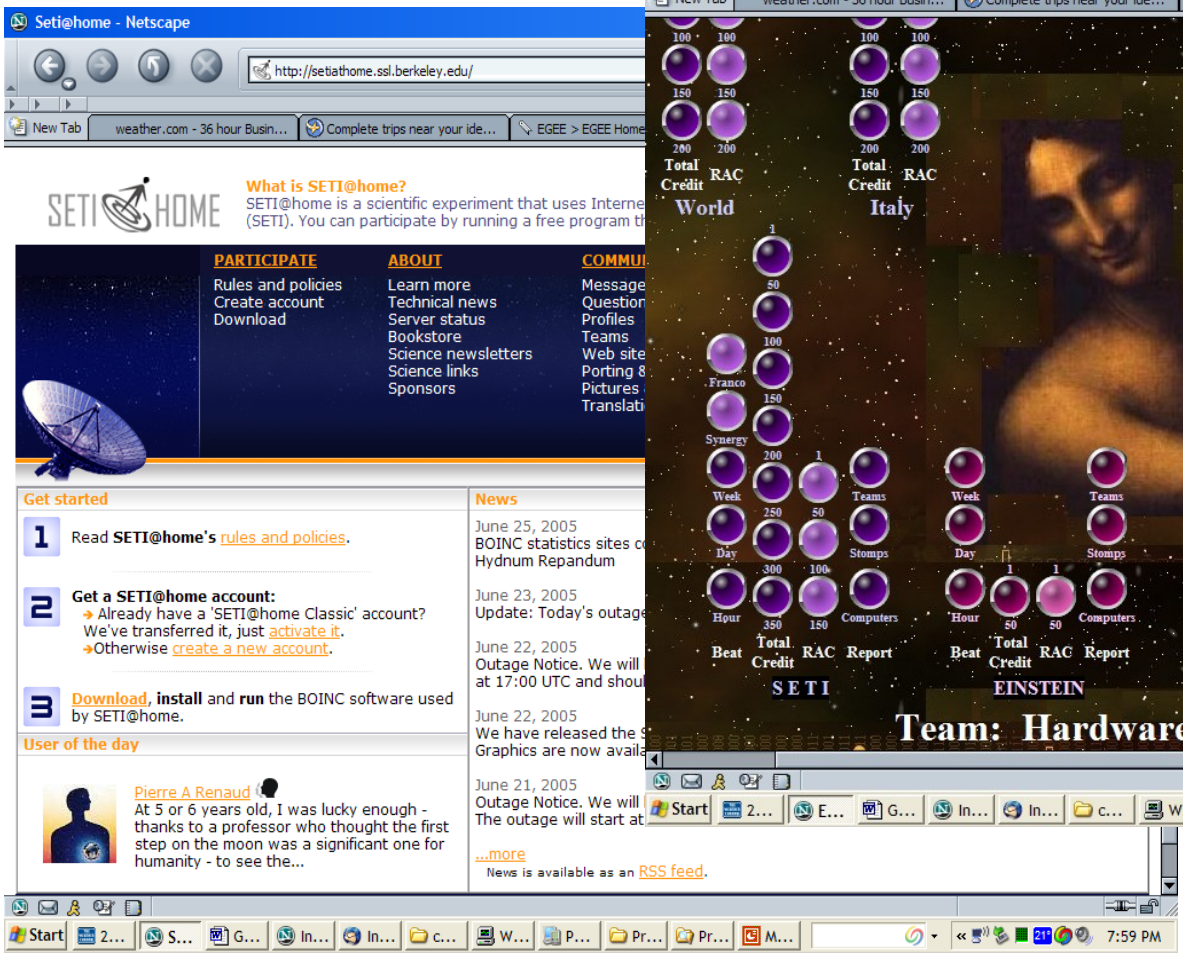
interactive physics analysis

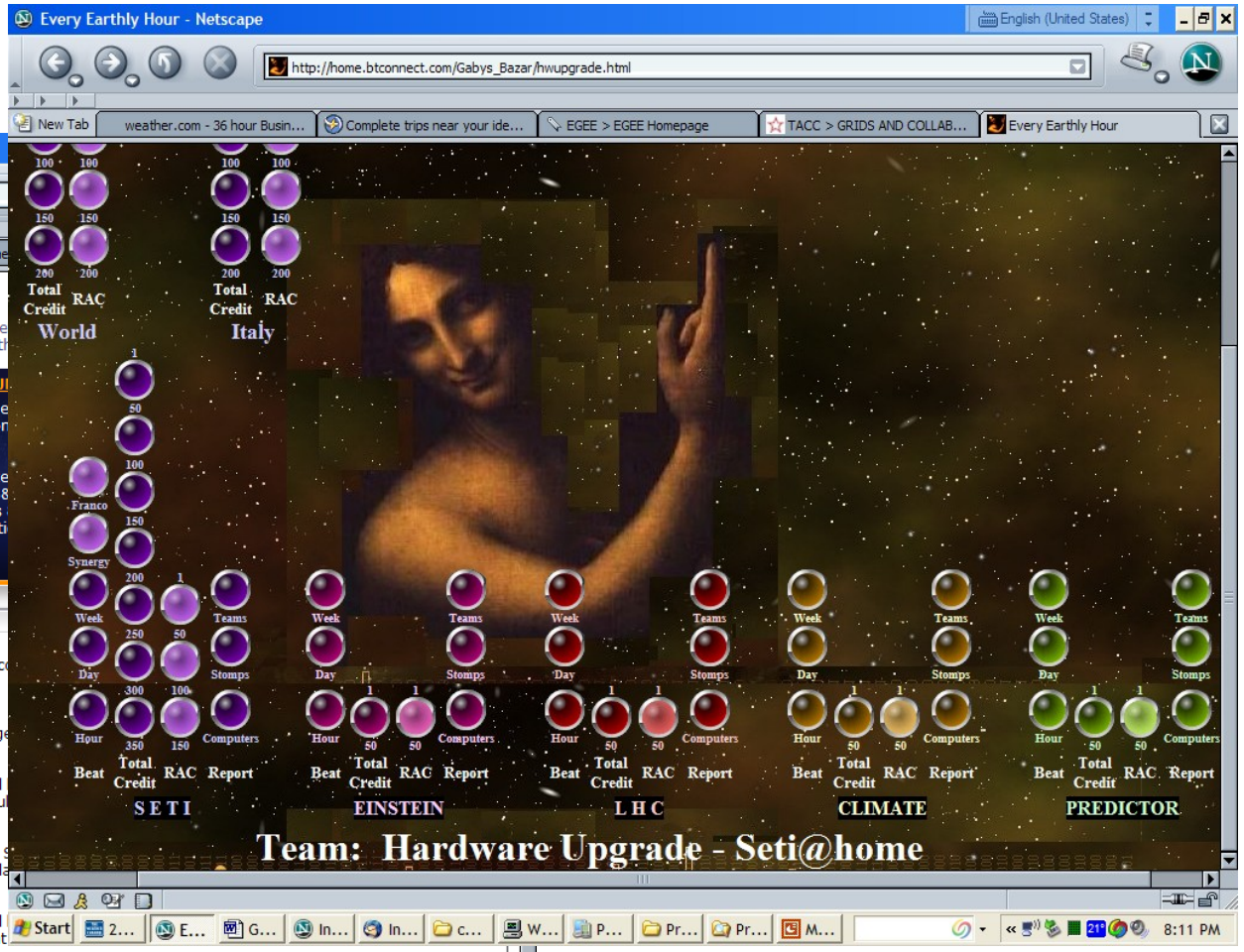
les.robertson@cern.ch

CERN

Donde todo comenzó.....

- www.mersenne.org números primos
- setiathome.ssl.berkeley.edu vida extraterestre (UCB)
- folding.stanford.edu Plegamiento de proteínas (Stanford)
- climateperdiction.net Predicción de Clima (Oxfod)
- lhcathome.cern.ch Modelaje de Colisiones de partículas (CERN)
- einstein.phys.uwm.edu Ondas Gravitaciales





US-VO Website - Netscape

http://www.us-vo.org/

US National Virtual Observatory

NATIONAL VIRTUAL OBSERVATORY

Home | Registry | Tools | Data Access | Publish | Education | NVO in Use

News

The International Virtual Observatory Alliance - Netscape

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http://www.ivoa.net/pub/members/

Aus-VO

AVO

ASTROPHYSICAL VIRTUAL OBSERVATORY

Astro Grid

China-VO

vo-i

OA

http://skys.gsfc.nasa.gov/docs/easy.html

SkyView

The Internet's Virtual Telescope

Home Help Non-Astronomer Basic Advanced Java

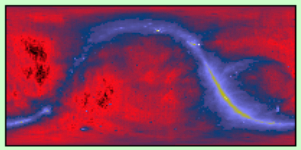
Non-Astronomer Page

This page is specifically designed for the non-astronomer to learn about astronomy and to display pictures of the celestial sky in multiple wavelengths. For first time users, we have an orientation page explaining the interface and the different choices you can make. Also, most everything on this page is a hyperlink to provide detailed explanation of terms and functions.

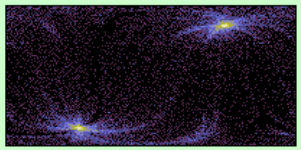
Below are images generated by SkyView showing the sky and different types of objects in various wavelengths. Click on the small images to get information on how they were created.

We have also generated some pages showing multiwavelength images of the celestial objects Cygnus Loop, Crab Pulsar, and Orion as examples of what *SkyView* can do.

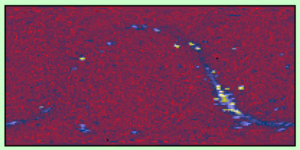
Images created using SkyView



All-sky image in radio waves



All-sky image in extreme UV light



All-sky image in X ray light

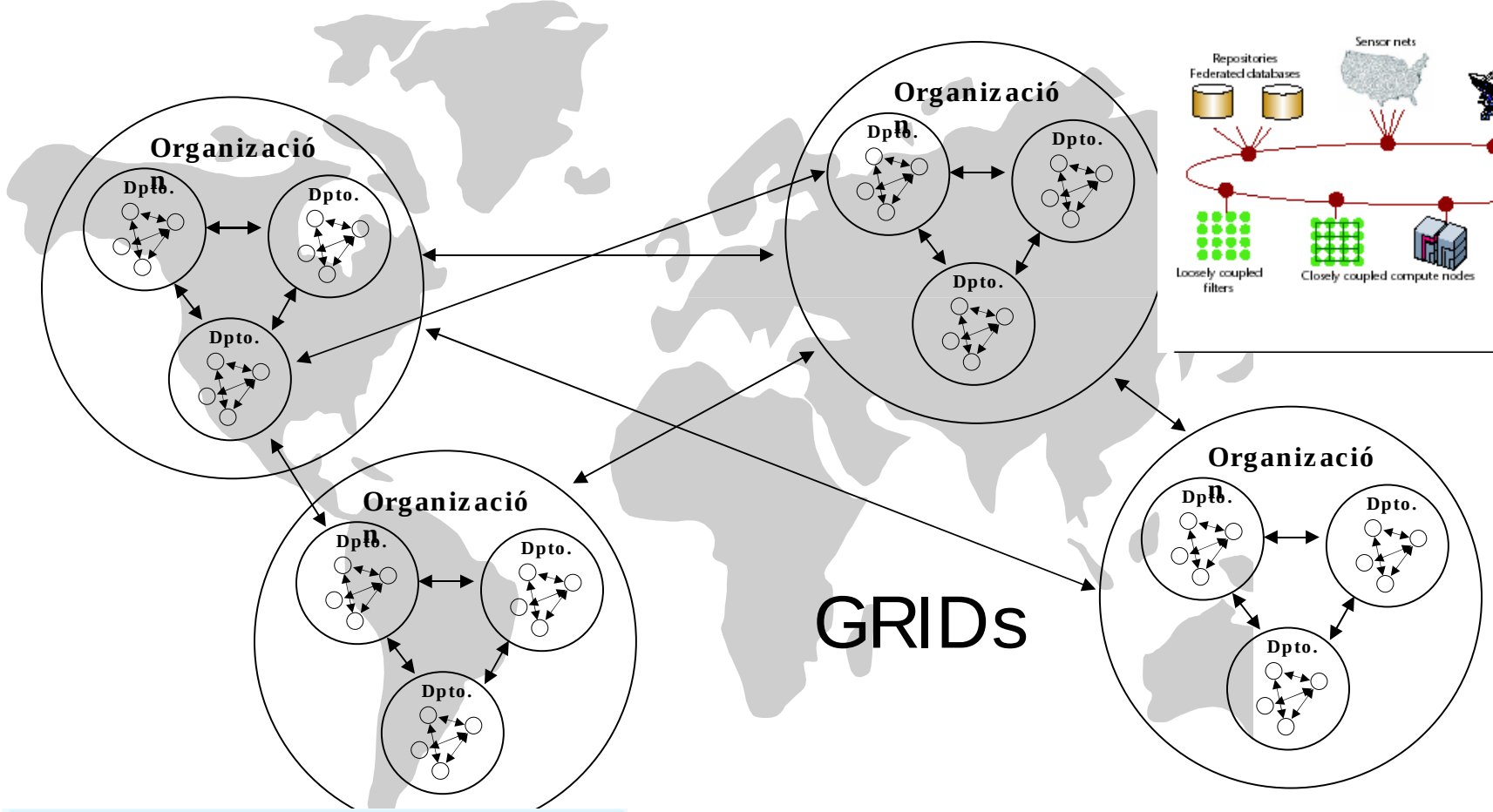
IVO

AL VIRTUAL OBSERVATORY

JVO

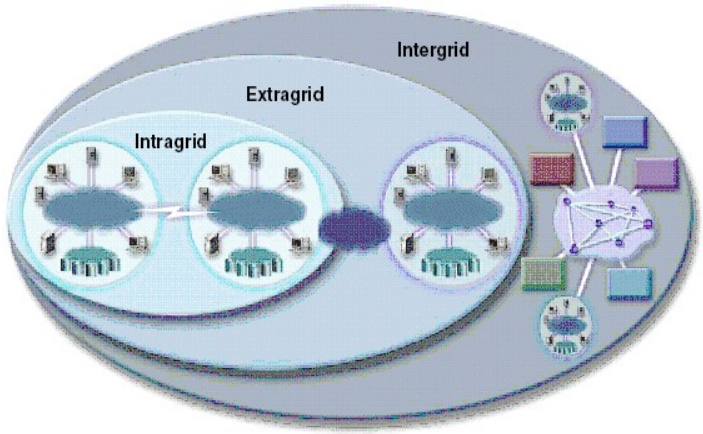
JAPANESE VIRTUAL OBSERVATORY

HVO



Grid Computing Web Sites

ASCI DISCOM	www.llnl.gov/asci/discom
Centurion	www.cs.virginia.edu/~legion/centurion/Centurion.html
Condor	www.cs.wisc.edu/condor
European Grid Forum	www.egrid.org
Globus	www.globus.org
Grid Forum	www.gridforum.org
GridFTP	www.globus.org/datagrid/gridftp.html
Gusto	www.globus.org/research/testbeds.html
NASA Information Power Grid	www.nas.nasa.gov/About/IPG/ipg.html
NCSA	www.ncsa.uiuc.edu
Nimrod	www.csse.monash.edu.au/~rajkumar/ecogrid
NPACI	www.npaci.edu
SARA	http://sara.unile.it/sara/



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17 Jan 2004: Endorsement system introduced.
15 Sep 2003: Announcement of New Quantitative Biology archive.
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[gr-qc/0107025] Nonlocal Equation of State in Anisotropic Static Fluid Spheres in

http://xxx.lanl.gov/abs/gr-qc/0107025

Nonlocal Equation of State in Anisotropic Static Fluid Spheres in General Relativity

Authors: H. Hernandez, L.A. Nunez
Comments: 21 pages, 1 figure, minor changes in the text, references added, two new solutions studied
Journal-ref: Can.J.Phys. 82 (2004) 29-51

We show that it is possible to obtain credible static anisotropic spherically symmetric matter configurations starting from known density profiles and satisfying a nonlocal equation of state. These particular types of equation of state describe, at a given point, the components of the corresponding energy-momentum tensor not only as a function at that point, but as a functional throughout the enclosed configuration. To establish the physical plausibility of the proposed family of solutions satisfying nonlocal equation of state, we study the constraints imposed by the junction and energy conditions on these bounded matter distributions.
We also show that it is possible to obtain physically plausible static anisotropic spherically symmetric matter configurations, having nonlocal equations of state\textit{,}concerning the particular cases where the radial pressure vanishes and, other where the tangential pressures vanishes. The later very particular type of relativistic sphere with vanishing tangential stresses is inspired by some of the models proposed to describe extremely magnetized neutron stars (magnetars) during the transverse quantum collapse.

Full-text: PostScript, PDF, or Other formats

References and citations for this submission:

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http://www.slac.stanford.edu/spires/find/hep/www?rawcmd=FIND+

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NONLOCAL EQUATION OF STATE IN ANISOTROPIC STATIC FLUID SPHERES IN GENER RELATIVITY.
By H. Hernandez, L.A. Nunez (Andes U., Merida),. Jul 2001. 17pp.
Published in **Can.J.Phys.82:29-51,2004**
e-Print Archive: **gr-qc/0107025**

References | LaTeX(US) | LaTeX(EU) | Harvmac | BibTeX | Cited 4 times
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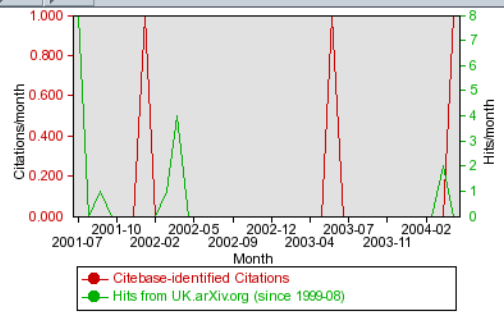

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[Abstract | References | Cited By | Co-Cited With]

G [1] Narasimhan, M.N.L., (1993), Principles of Continuum Mechanics, (John Willey, New York) p. 510.
G [2] Demianski M., (1985), Relativistic Astrophysics, in International Series in Natural Philosophy, Vol 110, Edited by D. Ter Haar, (Pergamon Press, Oxford).
G [3] Shapiro S.L. and Teukolsky S.A., (1983), Black Holes, White Dwarfs and Neutron Stars, (John Willey, New York).
[4] Balberg, S. and Shapiro, S.L. (2000) The Properties of Matter in White Dwarfs and Neutron Stars in Handbook of eprintElastic Properties, Edited by H.E. Bass, V.M. Keppens, M. Levy and R. Raspet (Academic Press, New York). [On line Los Alamos Archive Preprint]. Cited on 24 Apr, 2000, http://xxx.lanl.gov/abs/astro-ph/0004317.

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6:50 AM

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Follow-Up Conferences
CERN May 2004
SOUTHAMPTON Feb 2005
Golm NEW: Spring 2006
Conference on
Open Access to Knowledge in the Sciences and Humanities
20 - 22 Oct 2003, Berlin
Berlin Declaration
Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities
Preface
The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access.
We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance.
In accordance with the spirit of the Declaration of the Budapest Open Acess Initiative, the ECHO Charter and the Bethesda Statement on Open Access Publishing, we have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider.
Goals
Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the

El conocimiento, más allá de la mera Técnica

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http://www.combechem.org/

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The Combechem project is
funded by the EPSRC. The
crystallography and laser a
e-Lab, using pervasive con

The head of the project is

The latest news from

IBM Symposia Seri
From sp on 16/02/2005 at 17:27

The Faculty of Engineerin
aimed at undergraduates
and do not require any sp
they are taking place over
When: Wednesday 23r
Where: Building 35, Le
Download the Symposium
All members of the faculty

Comb-e-Day 2005
From sp on 04/02/2005 at 12:10

Comb-e-Day Talks

the Smart Tea Project - Netscape

http://smarttea.org/

the Smart Tea Project

"I can go anywhere and its, like, this is me and my data. Its all there, bang."

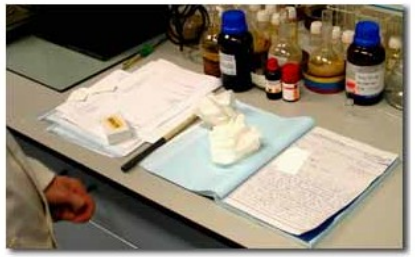
- Chris,
a real chemist, on using Smart Tea instead of a paper lab book.

Smart Tea is about improving the information environment for chemists doing chemistry - within and beyond the lab. Smart Tea is about supporting chemists in the preparation, execution, analysis and dissemination of their experimental work.

Background

When chemists run experiments, they create a great deal of information: they describe hypotheses; they delineate methods for testing those hypotheses; they reference others' efforts in similar experiments; they record exact amounts of chemicals used, and the methods for combining them; they analyse the success or failure of these results.

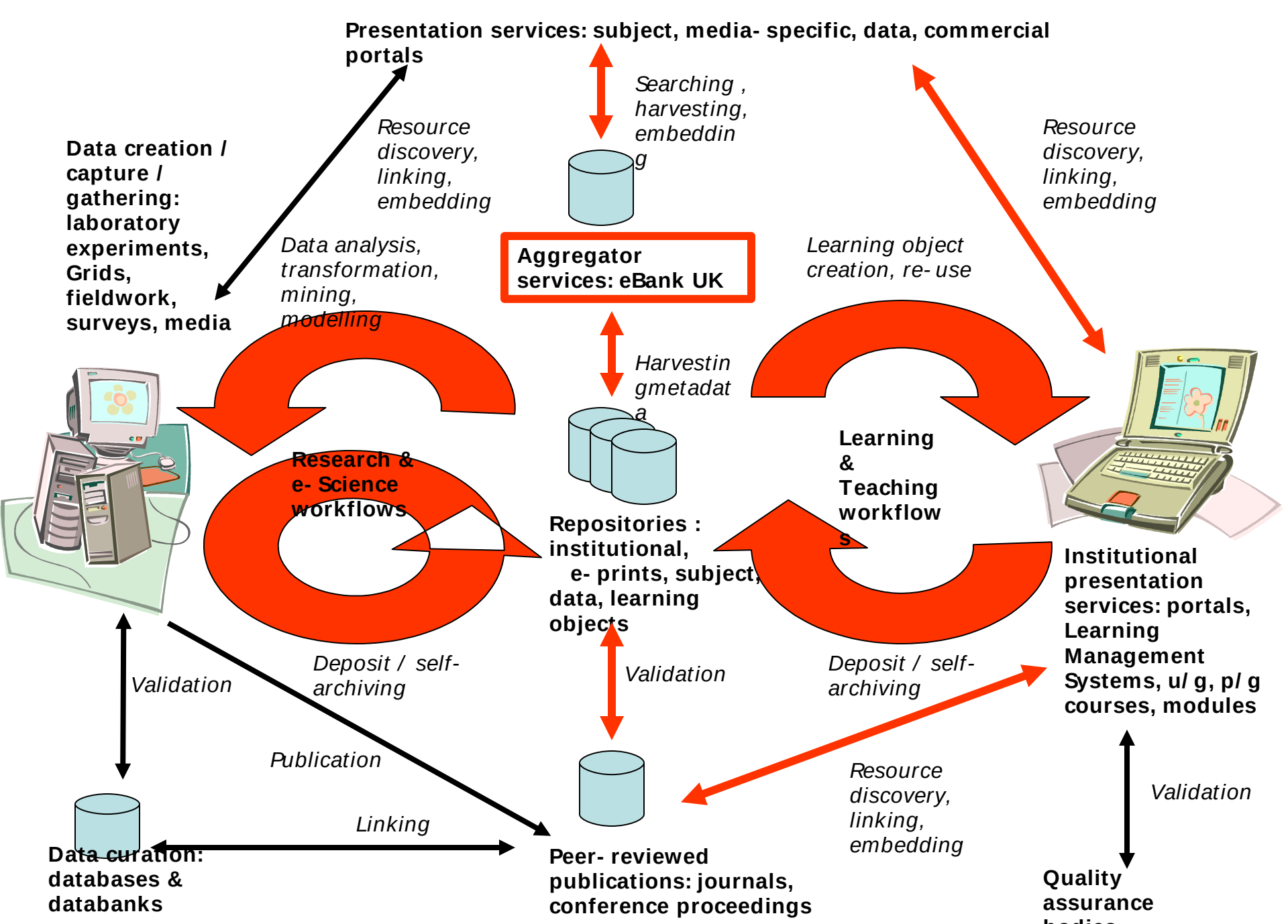
For all its technical sophistication, the modern lab experiment is still recorded using the same tools as scientists have been using over the past 200 years: a bound paper lab book (pictured right).



The flexibility of the lab book makes it great for chemists while carrying out an experiment: they can move it easily from their desk to the lab bench to a shelf. The book itself, however, is a poor mechanism for making the information stored in that book available to other scientists within the lab, or for that matter, to the same scientist after the experiment has been completed: if the scientist does not have the lab book to hand, the information is unavailable.

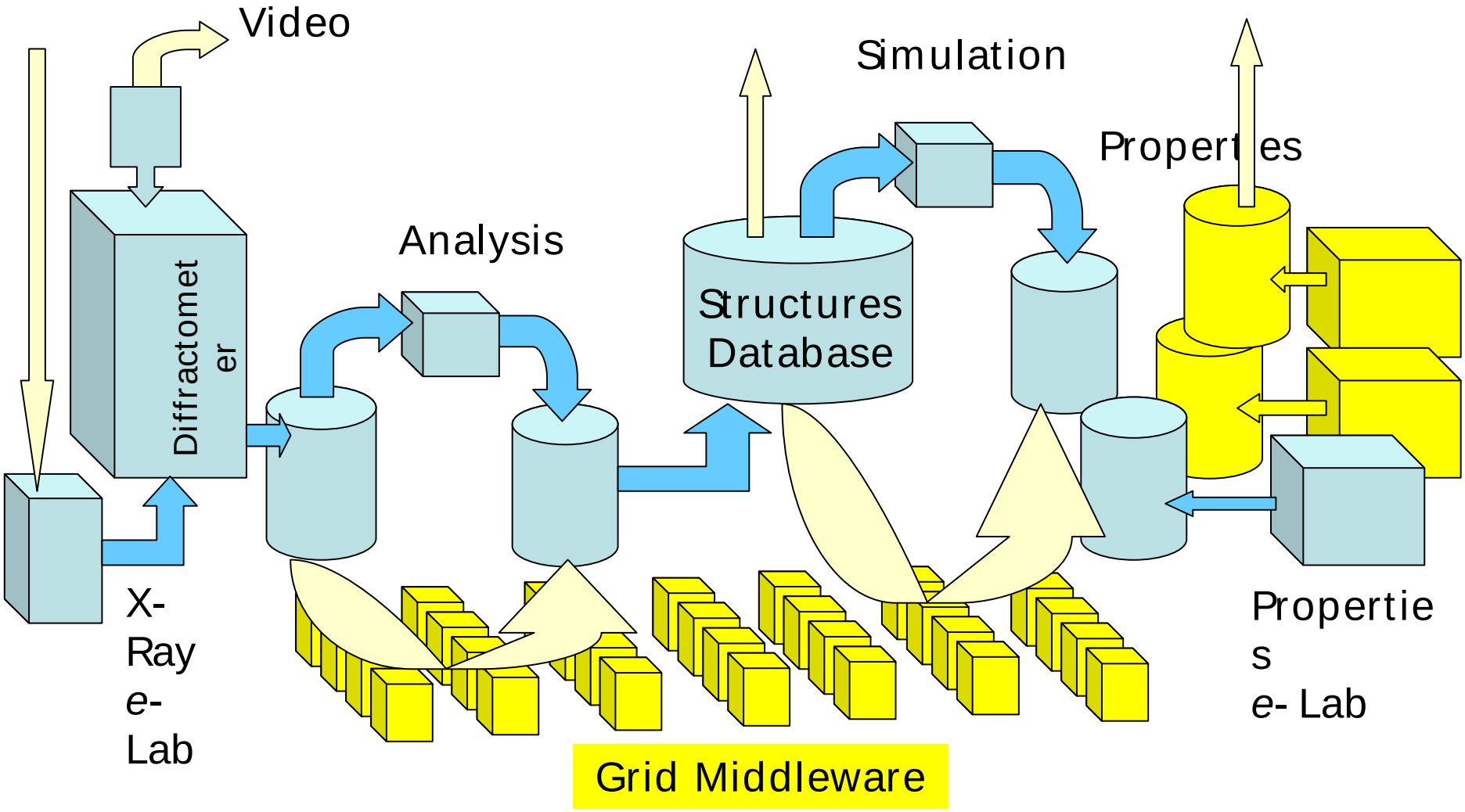
Motivation

Part of the world wide eScience Semantic Grid effort is to get the data crafted by individual scientists out of the lab and onto the Grid, where it can be accessed, compared and processed within the global science community.



Liz Lyon (2004) ***Realising the scholarly knowledge cycle*** http:// www.ukoln.ac.uk

Comb- *e*- Chem Project



Liz Lyon (2004) ***Realising the scholarly knowledge cycle*** http:// www.ukoln.ac.uk

¿Qué hay de nuevo ?

- **Se mantiene un 63% de la idea del programa de estudios propuesto (en Física no se puede inventar mucho)**
- **Presupone un curso propedeutico a distancia para nivelar las deficiencias del bachillerato,**
- **Se propone una licenciatura a 4 años y la tesis queda para un tercer ciclo Ese es el esquema de toda la Unión Europea a partir del 2007 y la tendencia que siguen también a escala Latinoamericana**
- **Se refuerza la idea de la Física como una Ciencias Experimental y se extiende la idea de los otros cursos del troncal de F' sica General (Ondas y Optica + Física Cuántica) con actividades de laboratorios simultáneas**
- **Se incluye un curso de Física Moderna, cuyo programa pueda cambiar cada año dependiendo de los nuevos descubrimientos y la actualidad de la Física. Un curso de FISICA MODERNA**
- **Se mantiene la idea de un Laboratorio de Física Avanzado en el cual el estudiante deba montar un experimento**
- **Se incluye un *e- laboratorio* (laboratorio in silico) para desarrollar experimentos a partir de datos de repositorios en INTERNET**

¿qué hay de nuevo ?

- **Se restituye el Curso de Ciencia y Sociedad. Hoy, más que nunca es pertinente generar una reflexión en ese aspecto. La Ciencia cada vez más es al motor de esta nueva sociedad.**

- **Se mantienen y se organizan los cursos de Tecnologías de Información propuestos.**
- **Se busca un enfoque de la Instrumentación Científica (y no la Electrónica que cada vez más está más lejos de nuestro alcance) orientada al desarrollo de interfaces tanto de *hardware* (las menos) como de software (las mas)**
- **+) Se añaden 4 cadenas de 2 electivas (Biomecánica, Bioinform‡tica, Computación Científica e Instrumentación Científica) a las tradicionales (Astrofísica, Física Te—rica, Geofísica, Materia Condensada, Sistemas Complejos)**

Los Troncales del Programa

32 Materias,

- Inactas 9
- Cambiadas de lugar 13
- Cambiadas de Concepto 8
- Nueva 2
- Eliminada 1

- México 8 Semestres
- Chile 8 Semestres
- Brasil 8 Semestres
- Colombia 10 semestres
- Argentina 10 Semestres
- Europa 6 semestres
- EEUU 8 semestres

Tesis o no Tesis, allí está el detalle

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