

Wellcome to CPS

惑星科学研究センター (Center for Planetary Science)

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&

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2011 年8月23-24日 Summer 2011 Kobe workshop of
MODEST-10d: High-Level Languages for Hugely Parallel
Astrophysics Simulations:
Dialogues between Computer Scientists and (Astro)
physicists



About YYH

Field: Geophysical Fluid Dynamics, Structures of Planetary Atmospheres

Method: Theoretical Approach with Numerical Simulations

Works :

- **Geophysical Fluid Dynamics**
 - wave and instability, wave-mean flow interaction
 - turbulent flow, angular momentum transport on a rotating sphere
 - dry convection, moist convection, organization of convective motion
 - convection in a rotating shell, zonal flow formation & a bit of MHD
- **Structures of Planetary Atmospheres, with numerical simulation of virtual (idealistic) atmospheres**
 - runaway greenhouse state
 - aqua-planet (Earth with no land surface)
 - synchronously rotating planet
 - general circulations of Earth-type atmospheres
 - convection in Martian atmosphere, in Jupiter atmosphere
- **Yet another (open) development of (hierarchical) models for planetary atmospheres (environmental issues not as main target) and tools for them**

With many collaborators,

especially as GFD Dennou Club (地球流体電脳俱樂部)

About GFD Dennou Club

- A Japanese volunteer-base (grass-root or not funded) project of atmospheric, physical oceanographic, and planetary fluid scientists on various aspects of their computer use.
- GFD = Geophysical Fluid Dynamics
- Dennou (電脳) = euphemistic expression for electric computers
- Now, 10~20 “active” members from senior level to student level

About GFD Dennou Club

- Founded in 1988
by M. Shiotani, S. Sakai, S. Yoden, & Y-Y Hayashi
- At the dawn of Internet era, new basis (resources) for education and research corresponding to development of information technology was expected to be needed and established.
 - Change of method from mathematical theory to numerical simulation
 - Change of knowledge base from papers or text books to digital information of various types in general
- Resources should be free from copy right issues
 - Anyone can use, copy, change, and re-distribute changed ones like theories based on mathematics

About GFD Dennou Club

- Development of hierarchical numerical models
 - from simple GFD models, 1D energy models, to dynamo models, general circulation models, etc,
 - with common coding rules and common I/O routines (gtool5)
 - aiming at simulation of possible environments of virtual planets
- Development of data analysis and visualization tools
 - Gphys = ruby tools for data handling and visualization
- Knowledge & Data archive
 - those programs, of course
 - GFD laboratory experiments
 - theoretical documents, tech notes
 - satellite and objective analysis data
 - organizing seminars and multi-media archive of them
- Internet servers www.gfd-dennou.org
 - development and communication environment

About CPS

CPS, Center for Planetary Science, established 2007 April

- Aiming to be an organization like

- LPI (Lunar and Planetary Institute, Heuston)
- ISSI (International Space Science Institute, Bern)
- KITP (Kavli Institute of Theoretical Physics, Santa Barbara)
- Newton Institute (Cambridge)
- ...

- Open to scientists in the world and assists them to overcome barriers between their specialized fields in planetary science incidental to its academic development. CPS aims

- to play a role as a catalyst for human resource development and research activities
- to provide a site where people from various fields related to planetary science get together and accumulate their knowledge and information
- to play the most vital role in developing planetary science in terms of its extension and long-term vision.

- Some of the base ideas (and tools) are from GFD Dennou Club

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- We have to establish within 1.5 years, i.e., before the end of present fund, G-COE (Global Center of Excellence)
- Need your supports!, thank you

Please enjoy your stay