

# GTP Annual Meeting - 2012

Annick Pouquet

January 24, 2012

## In attendance:

Jim Brasseur (ACD/MMM), Wojciech Grabowski (MMM), Jose Garcia (CU),  
Tom Horst (EOL), Hsiao-ming Hsu (CGD), Don Lenschow (MMM),  
Sacha Madronich (ACD), Mark Miesch (HAO), Ralph Milliff (CoRA),  
Pablo Mininni (IMAGE), Doug Nychka (IMAGE), Ned Patton (MMM), AP (IMAGE),  
David Richter (MMM), Duane Rosenberg (IMAGE), Piotr Smolarkiewicz (MMM),  
Peter Sullivan (MMM)

# AGENDA

- Planned workshops in F'12
- Turbulence Theme Of the Year (TOY) in F'12 & *petascale*
- GTP website <http://gtp.ucar.edu/>, and other websites
- Boundary Layer Working Group and related activities in F'12
- TRIG: Turbulence Research Institute for Geophysical flows
- How did we spend our monies in F'11
- Carry-over from F'11 and available budget for F'12, & *F'13*
- Suggestions for seminars, visitors and workshops
- Others
- Discussion

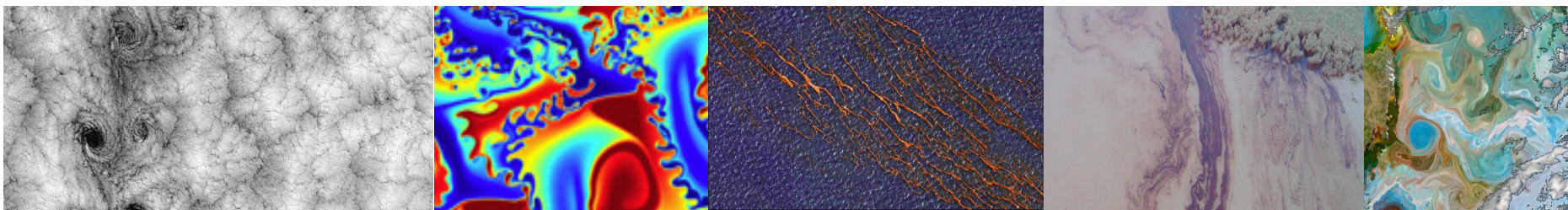
# Three GTP-related Workshops in F'12

**Wave-Turbulence Interactions in Stable Atmospheric Boundary Layer**  
Jielun Sun, Larry Mahrt and Carmen Nappo, with Bill Neff (NOAA) @ NCAR, 25-26 July

**Multiphase Turbulent Flows in the Atmosphere and Ocean**  
Wojciech Grabowski, Harm Jonker, Peter Sullivan & Lian-Ping Wang @ NCAR 8/13-17

Also:

**Connections between rotating stratified turbulence, and climate:  
theory, observations, experiments and models**  
Baylor Fox-Kemper, Keith Julien & AP, TOY workshop @ CU, May 14-18 [2 NSF grants]



## NCAR IMAGE Theme of the Year 2012: Connections between Rotating, Stratified Turbulence and Climate: Theory, Observations, Experiments, and Models

**Hosted by NCAR, CIRES, and NSF: May 14-18, 2012.**  
**APPLICATION DEADLINE MARCH 1, 2012.**

### Details

**When:** May 14-18, 2012

**Where:** CIRES Auditorium at CU-Boulder and the NCAR Mesa Lab

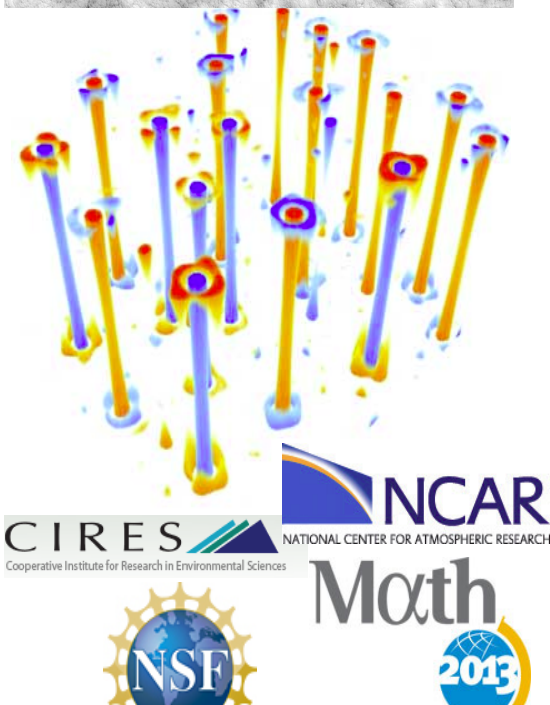
**Please register in advance [here](http://tinyurl.com/TOY2012).**  
<http://tinyurl.com/TOY2012>

The climate system is chaotic, with limited predictability and difficulty in modeling all relevant scales. Current models and simulations of rotating, stratified turbulence in the atmosphere and oceans are conducted at parameters that do not closely resemble observed, realistic values. Multiscale simulations are usually limited on both the grid scale and domain size. It is therefore clear that many advances must occur through new model development and associated simulations utilizing extreme parameter values in an asymptotic manner. This will require as well a body of knowledge gained from large-scale direct numerical simulations (DNS) and Large Eddy Simulations (LES) that explore the computationally accessible moderate values in controlled settings, as well as observations and laboratory experiments to access the physically meaningful extreme values.

The Theme of the Year (TOY) 2011/2012 workshop, 'Connections between Rotating, Stratified Turbulence and Climate: Theory, Observations, Experiments, and Models', will bring together researchers with primary interest in the above topics and their applications to development of scalings and parameterizations of these processes and the quantification and understanding of their impacts on the climate system. The workshop will be preceded by one day of lectures intended for graduate students and young researchers in order for them to learn about the issues in RST and profit fully from the workshop itself.

The opening day of pedagogical lectures include talks by: Peter Bartello, Eric D'Asaro, Robert Ecke, Leslie Smith, and Geoffrey Vallis. Research topics will be introduced by: Alberto Naviera-Garabato, Rupert Klein, Jim McWilliams, Julie McClean, and Andy Majda. Other attendees include: J. Aurnou, C. Cambon, C. Cenedese, R. Ferrari, and F. Moisy.

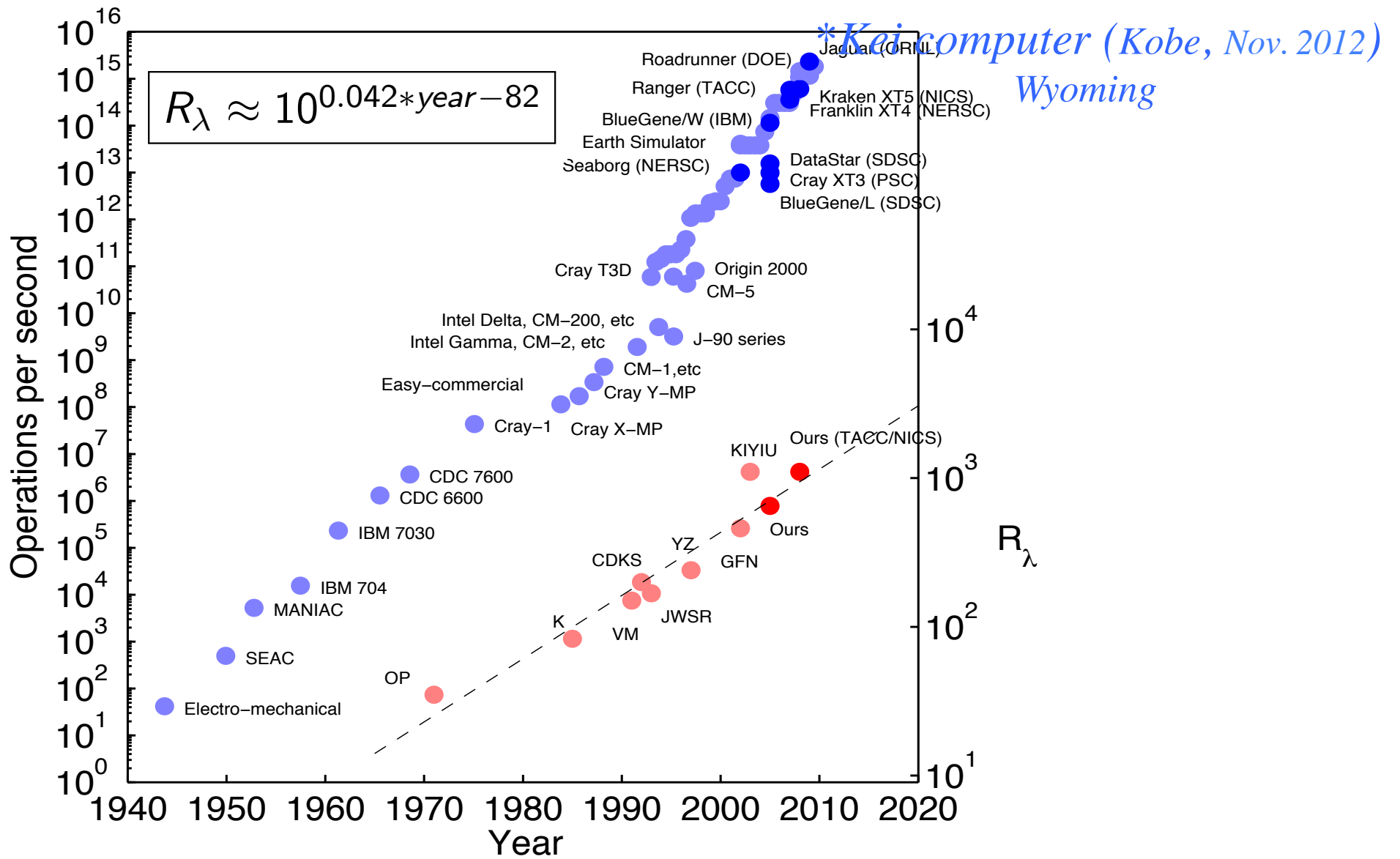
The workshop and scientific forum is supported by NSF and NCAR (PIs Julien and Smith, Co-Is Fox-Kemper, Weiss, Kurien, and



## TOY-related students<sup>+</sup> visitors, January-June, with offices at the Mesa Lab

- Katherine McCaffrey
- Adrean Webb
- Scott Bachman
- Sean Haney
- Peter Hamlington
  
- Cecilia Rorai (ASP graduate student, *then RSVP*)
- *Raffaele Marino (NSF post-doc for 2 years)*

- IMAGE **TOY** on **rotating stratified turbulence and climate** for ~ 40+k: sabbatical contribution for Baylor Fox-Kemper, Director, and Keith Julien (CU), *in collaboration with Jeff Weiss (CU), Leslie Smith (Wisconsin), Susan Kurien (LANL) & AP (+ NSF funds)*
- An **ASP fellowship** for Jim Brasseur, on sabbatical, to work on **atmospheric chemistry and turbulence in the PBL** (*hosts: Sasha Madronich, ACD, with Ned Patton & Peter Sullivan, MMM*)
- *A stimulus-package post-doc for F' 10/F ' 11 on petascale and turbulence: Zbigniew Piotrowski, MMM*
- **GTP: Peta-scale & Wyoming, preparation for exascale, ...**



After Donzis, 2010

# GTP Website

- <http://gtp.ucar.edu/> IN NEED OF A PICTURE/MOVIE  
which we could change every year (or accumulate)

Please send your favorite pictures to me!

- Other website (*Joe Tribbia*)

<http://web.mit.edu/afs/athena.mit.edu/user/r/e/redingt/wwww/netadv/welcome.html>

and go to T → Turbulence

*Site mentions:* <http://www.ionasoftware.com/gross/fluids/turbulence.html>

*Problem of maintenance over the years ...*



# GTP website (1)

- Research on turbulence has been a significant part of the NCAR scientific program since its beginning in the early 1960's. The original scientific leaders of NCAR recognized that in order to understand the dynamics of the atmosphere, the oceans, the climate, the sun, and solar-terrestrial interactions, understanding relevant turbulent processes would be essential. A number of scientific appointments in the first 10-15 years of NCAR's existence reflected this view and provided an in-house base from which to productively interact and collaborate with the world turbulence community. From these beginnings has emerged a sustained emphasis on geophysical turbulence at NCAR, in research, visitors, seminars, and workshops that continues to this day. Much of this emphasis manifests itself currently in the **Geophysical Turbulence Program (GTP)** , and its complementary activity, the [Turbulence Numerics Team \(TNT\)](#).

*Comments welcome!*

## GTP website (2)

### **Philosophical orientation**

The orientation of GTP is very much toward basic science and is highly inclusive and outreaching. The full range of scientific methods--analytical theory, statistical analysis, stochastic modeling, algorithm development, numerical simulation, parameterization, closures for weak and strong turbulent flows, analyses of observational data, field programs, and laboratory experiments-- are represented in the interests of the members, as well as in the seminar topics, and particularly the workshops. University faculty and scientists from abroad are heavily represented in the workshops. Many areas of geophysical and astrophysical fluid dynamics and magnetohydrodynamics are included as well as laboratory and engineering fluid dynamics. GTP treats the disciplinary boundaries between turbulence and fluid dynamics as fuzzy and porous and reaches well beyond what might be characterized as classical turbulence studies and topics.

*Comments welcome!*

## Boundary Layer: Proposal to NESL retreat

- **Improving Boundary Layer Physics & Chemistry Parameterization in Numerical Models**

*Jielun Sun, Peter Sullivan, William Large, Joe Tribbia,  
Ned Patton, Jimmy Dudhia, Thomas Karl, Annick Pouquet,  
Donald Lenschow and Sungsu Park*

Three main themes of NESL retreat: climate uncertainty and chemistry; convection & aerosols; and regional severe weather

# Turbulence Research Institute for Geophysical flows, or TRIG

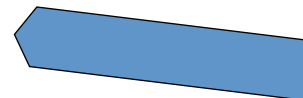
- Contacts with various people
- National support and workshop planned in LANL next year (Beth Wingate and Bob Ecke)
- International support and request for coordination (Europe, India)
- GTP funds last year for a small meeting, *unspent*

## Travelers and Expenses GTP 2010-2011

Arrival	Departure	TV#/VA#	First	Last	Cost	\$	Acct key	Host	Affiliation	Program
10-Oct-10	13-Oct-10	TV131854	Mahendra	Verma	Hotel, per diem, ground	\$498	732401	present GTP seminar	I. I. T. Kanpur	GTP
11-Oct-10	23-Oct-10	VA132752	Jean Francois	Pinton	lodging and per diem	\$1,763	732401	Annick and Mark Rast	Ecole Normale Supérieure de Lyon et CNRS	GTP
16-Oct-10	18-Oct-10	TV132263	Greg	Holloway	hotel, per diem, car	\$404	732403	Jack herring	Fisheries and Ocean Canada	
17-Oct-10	19-Nov-10	VA133336	Jim	McWilliams	TLPD	\$3,000	732,401	Joe Tribbia-GTP	UCLA	GTP NESL
25-Oct-10	23-Nov-10	VA132183	Stefan	Heinz	TLPD	\$1,500	730108	work with Annick and P. Sullivan	University of Wyoming	RSVP GTP
8-Nov-10	8-Nov-10	TV133716	Harish	Gopalan	RT mileage	\$145	732403	Present a GTP talk	University of Wyoming	GTP
1-Dec-10	3-Dec-10	TV132897	Snezhana	Abarzhi	flights, per diem, ground, lodging	\$858	732403	GTP Talk	University of Chicago	GTP
13-Mar-11	20-Mar-11	VA140917	Rupert	Klein	Lodging	\$448	732403	work with P. Smolarkiewicz	Freie Universitat Berlin	GTP
25-Mar-11	2-Apr-11	VA140923	Joanna	Szmelter	Lodging	\$512	732403	collaborate with Piotr	Loughborough University	GTP
2-May-11	30-Jul-11	VA136718	Christian	Kuehnlien	flight	\$1,499	60305,	To collaborate with Piotr	Deutsches Zentrum fur Luft- und Raumfahrt	MMM
31-May-11	3-Jun-11	TV138109	Dhrubaditya MITRA	Mitra	all	\$281	732001	GTP talk	NORDITA	TNT
1-Jun-11	1-Jul-11	VA137991	Chunlei	Liang	Rental Car	\$978	732403	collaborate with Mark Miesch HAO and Annick	George Washington University	GTP HAO
5-Jul-11	7-Jul-11	TV138340	PK	Yeung	airfare, lodging, local expenses	\$615	732403	GTP seminar	Georgia Tech	GTP
5-Jul-11	30-Sep-11	VA139135	Harm	Jonker	TLPD	\$3,135	732401	GTP work with P Sullivan	Delft University of Technology	GTP
14-Jul-11	20-Jul-11	TV139241	Colm	Connaughton	hotel	\$504	732403	GTP seminar	Warwick Mathematics Institute and Warwick Centre for Complexity Science	GTP
1-Aug-11	30-Aug-11	VA139288	Fabienne	Lohou	split TLPD with MMM	\$2,970	732401	Work with Ned Patton	Laboratoire d'Aerologie, Centre de Recherches Atmospheriques	MM GTP
21-Sep-11	14-Oct-11	VA137737	Marc	Brachet	TLPD and airfare	\$3,851	730108	Annick	Ecole Normale Supérieure, Paris	RSVP GTP
22-Sep-11	1-Oct-11	VA140226	Jean Francois	Pinton	Airfare, hotel, per diem	\$2,806	732001	Annick	Ecole Normale Supérieure de Lyon et CNRS	TNT

Mitra canceled trip, airfare cost still available for reuse (minus exchange fees)

Account key	Description	
730108	RSVP	\$5,351
732001	IMAGe Visitor	\$4,586
732403	GTP Visitor	\$4,464
732401	GTP	\$11,366



Total of 15830 in F'11

## TNT GTP Visitors 2010-2011

(Includes Seminars by non GTP visitors who presented joint talks)

Arrival	Departure	First	Last	Seminar (Some joint seminars are with non-GTP visitors but other divisions)	Visit	Affiliation
1-Dec-10	3-Dec-10	Snezhana	Abarzhi	Turbulent Mixing and Beyond: Problems, Concepts, Solutions	GTP Talk	University of Chicago
3-Aug-11		Orlando	Ayala	Methods and Issues for Highly-scalable Turbulence Simulations	GTP-MMM Seminar	University of Delaware
25-Apr-11	28-Apr-11	Allen	Boozer	Constraints on magnetic reconnection and the solar corona from fundamental electrodynamics	GTP/HAO seminar-Miesch/Low	Columbia University
21-Sep-11	14-Oct-11	Marc	Brachet	A simple model of dissipative dynamics in superfluids: the (spectrally-truncated) Gross-Pitaevski Equation	Annick	Ecole Normale Supérieure, Paris
14-Jul-11	20-Jul-11	Colm	Connaughton	Feedback of zonal flows on Rossby/drift-wave turbulence driven by small scale instability	GTP seminar	Warwick Mathematics Institute
10-May-11		Jorgen	Frederiksen	Subgrid Modelling for Geophysical Flows	CGD-MMM-GTP Seminar	CSIRO Marine and Atmospheric Research
25-Jul-11	12-Aug-11	Oliver	Fuhrer	Preparing the Numerical Weather Prediction Model COSMO Emerging Hardware Technologies	MMM Zbigniew	MeteoSwiss, Zurich, Switzerland
8-Nov-10	8-Nov-10	Harish	Gopalan	New Developments in Turbulence Modeling II. Applications	Present a GTP talk	University of Wyoming
1-Nov-10	16-Nov-10	Tobias	Heinemann	no	Jim McWilliams and Annick	IAS, Princeton
25-Oct-10	23-Nov-10	Stefan	Heinz	New Developments in Turbulence Modeling I. Theory	Annick and P. Sullivan	University of Wyoming
16-Oct-10	18-Oct-10	Greg	Holloway	Eddy Stress and Shear in 2-D Flow	GTP talk work with Jack herring	Fisheries and Ocean Canada
5-Jul-11	30-Sep-11	Harm	Jonker	Petascale Direct Simulations to Determine the Growth-Rate Law of Convective Boundary Layers	GTP work with P Sullivan	Delft University of Technology
13-Mar-11	20-Mar-11	Rupert	Klein	no	work with P. Smolarkiewicz	Freie Universitat Berlin
10-Nov-10		Jun-Hong	Liang	Modeling the Bubbly Ocean	MMM-GTP Seminar	UCLA
1-Jun-11	1-Jul-11	Chunlei	Liang	no	Mark Miesch HAO-Annick	George Washington University
1-Aug-11	30-Aug-11	Fabienne	Lohou	no	Work with Ned Patton	Laboratoire d'Aerologie, Centre de Recherches Atmospheriques
10-Sep-10	10-Oct-10	Jakob	Mann	no		Risø
1-Jun-10	31-Dec-10	Jeremy	McCaslin	no	work with Annick	University of Colorado, Boulder
26-Jan-11	27-Jan-11	Sean	McKenna	no	no office needed	Sandia National Laboratories
17-Oct-10	19-Nov-10	Jim	McWilliams	no	Collaborate with Joe Tribbia?	UCLA
31-May-11	3-Jun-11	Dhrubaditya MITRA	Mitra	X	GTP talk	NORDITA
6-Nov-10	26-Nov-10	Christian	Ohlwein Schoelzel	no	work with Gene Wahl and GSP	University of Bonn
11-Oct-10	23-Oct-10	Jean Francois	Pinton	Particles in Turbulence: Size Effects	Annick and Mark Rast	Ecole Normale Supérieure de Lyon et CNRS
22-Sep-11	1-Oct-11	Jean Francois	Pinton	Mechanisms for generation and saturation of the dynamo field in the VKS experiment	Annick	Ecole Normale Supérieure de Lyon et CNRS
11-Oct-10	23-Oct-10	Mark	Rast	no	work with annick and JF	CU Boulder
8-Nov-10	8-Nov-11	Mark	Rast	no	work with annick and JF	University of Colorado, Boulder
26-Jan-11	27-Jan-11	Jaideep	Ray	no	no office needed	Sandia National Laboratories
16-Mar-11	16-Mar-11	Zbigniew	Sorbjan	A Study of the Stable Boundary Layer Based on a Single-K-Theory Model	MMM/GTP visitor no cost	Marquette University
25-Mar-11	2-Apr-11	Joanna	Szmelter	no	collaborate with Piotr	Loughborough University
26-Jan-11	27-Jan-11	Bart	van Bloemen Waanders	no	no office needed	Sandia National Laboratories
10-Oct-10	13-Oct-10	Mahendra	Verma	FieldReversals in Rayleigh Benard	present GTP seminar	I. I. T. Kanpur
6-Nov-10	26-Nov-10	Gene	Wahl	no	work with Schoelzel and Doug	NOAA
5-Jul-11	7-Jul-11	PK	Yeung	Petascale Computing and the Study of Turbulent Mixing and Dispersion	GTP seminar	Georgia Tech

In F'11, 15 seminars, mostly CGD/MMM

## TNT GTP Visitors 2010-2011

(Includes Seminars by non GTP visitors who presented joint talks)

Visitors October 1, 2011 - September 30, 2012						
Arrival	Departure	First	Last	Seminar (Some joint seminars are with non-GTP visitors but other divisions)	Visit	Affiliation
6-Jan-12	1-Jun-12	Scott	Bachman	no	TOY-CU	CU, Boulder
17-Jan-12	19-Jan-12	Amitava	Bhattacharjee	Onset of Fast Reconnection in High-Lundquist-Number Plasmas Mediated by the Plasmoid Instability	GTP/HAO seminar: Miesch Pouquet	University of New Hampshire
12-Jan-12		Jim	Brasseur	Transformation from Isotropic to Shear-dominated Turbulence in 3-D Physical and Spectral Space	GTP-MMM Seminar	PSU
12-Feb-12		Jim	Brasseur	Accuracy in LES Prediction of the Atmospheric Surface Layer: the SFS Stress Model, the Surface Stress Model, and Numerical	ASP-GTP Seminar	PSU
16-Jan-12	18-May-12	Mike	Calkins	no	TOY-CU	CU, Boulder
6-Jan-12	1-Jun-12	Baylor	Fox-Kemper	no	TOY-CU	CU, Boulder
6-Jan-12	1-Jun-12	Peter	Hamlington	no	TOY-CU	CU, Boulder
6-Jan-12	1-Jun-12	Sean	Haney	no	TOY-CU	CU, Boulder
18-Jan-12	19-Jan-12	Dan	Haworth	Modeling Interactions among Turbulence, Gas-Phase Chemistry, Soot Particles and Radiation in Flames	GTP seminar	Penn State
12-Dec-11	14-Dec-11	Corentin	Herbert	Large-scale atmospheric flows predicted by statistical mechanics	GTP-CGD seminar	Laboratoire des Sciences du Climat et de l'Environnement, France
16-Jan-12	18-May-12	Keith	Julien	no	TOY-CU	CU, Boulder
6-Jan-12	1-Jun-12	Katherine	McCaffrey	no	TOY-CU	CU, Boulder
27-Oct-11		Yannick	Mellier	The CIRES Tethered Lifting System: A State-of-the-art Tethersonde for the Measurement and Study of the Structure, Dynam	GTP seminar	CIRES, CU
16-Jan-12	18-May-12	David	Nieves	no	TOY-CU	CU, Boulder
1-May-12	31-May-12	Alain	Pumir	no	TNT visitor	ecole normale superieure, lyon
8-Nov-11	30-Nov-12	Mark	Rast	no		University of Colorado, Boulder
16-Jan-12	18-May-12	Antonio	Rubio	no	TOY-CU	CU, Boulder
6-Jan-12	1-Jun-12	Adrean	Webb	no	TOY-CU	CU, Boulder

F' 12, 6 more seminars for a total of ~ 1.6k

# Funds still available to spend in F' 12:

91-60-2 (IMAGe)+17(lock box)=46k

*(F'13, if budget is flat and if no carry-over, < 47k)*

- Reserve:
- Previously committed expenses? (*TRIG & SLE workshops, ...*)
  
- Seminars:
- Visitors:
  
- *Support for the BL working group? [2-months grad student?]*
- *Partial support for grad student and/or post-doc? [1 request]*
  
- Workshop in F'13: 27k or 30k? *[1 request]*  
*[Have registration fees, at least for local costs?]*



# DISCUSSION

And now, your input!

- Workshops
- Seminars
- Visitors
- Students

# DECISIONS (1)

- Reserve: 4k
- TRIG meeting: 7.5k
- Grad. student: *Lisa Dirks* (Hosts: Steve Oncley & Tom Horst, 6 month visit, co-sponsoring by EOL): 4.5k
- Grad. student: *Silvester Anabas* (Hosts: Wojciech Grabowski and Piotr Smolarkiewicz, MMM): 2k
- Junior scientist fund (1, 2 & 3), related to GTP retreat 5k  
**>>>Please send a 1-paragraph proposal for this fund (purpose of request & desired amount), to [pouquet@ucar.edu](mailto:pouquet@ucar.edu) by February 24**

**F'13: Workshop on LES, HAO+, 30k**, with possibly 17k for visitors

*Issue for F'14: we may have to choose between lower amounts for workshops vs. visitors if budgets do not grow back*

# DECISIONS (2): Visitors

All visitors give at least one seminar; overhead included in allocated sums, unless visitor stays only for 3 (or 4?) days:

- *Ian Harmann* (Host: Ned Patton, MMM): 4k
- *David Gurarie* (H: Don Lenschow, MMM): 3k
- *Dmitri Mironov* (H: Peter Sullivan, MMM): 5k
- *Arakel Petrosyan* (H: Mark Miesch, HAO): 2k
- *Eric Lindborg* (H: Duane Rosenberg, IMAGE): 2k
- *Hélène Politano* (H: Annick Pouquet, IMAGE): 3.5k
- *Alain Noullez* (H: Annick Pouquet, IMAGE): 3.5k

*[Raymond Shaw from EOL coming to the August workshop]*

*[Also note the lack of seminar invitees for < 4 days this year]*

**TOTAL: 46k, all available monies engaged**

**>>> You will find the slides presented at the meeting at <http://gtp.ucar.edu/>**

**Thank you!**