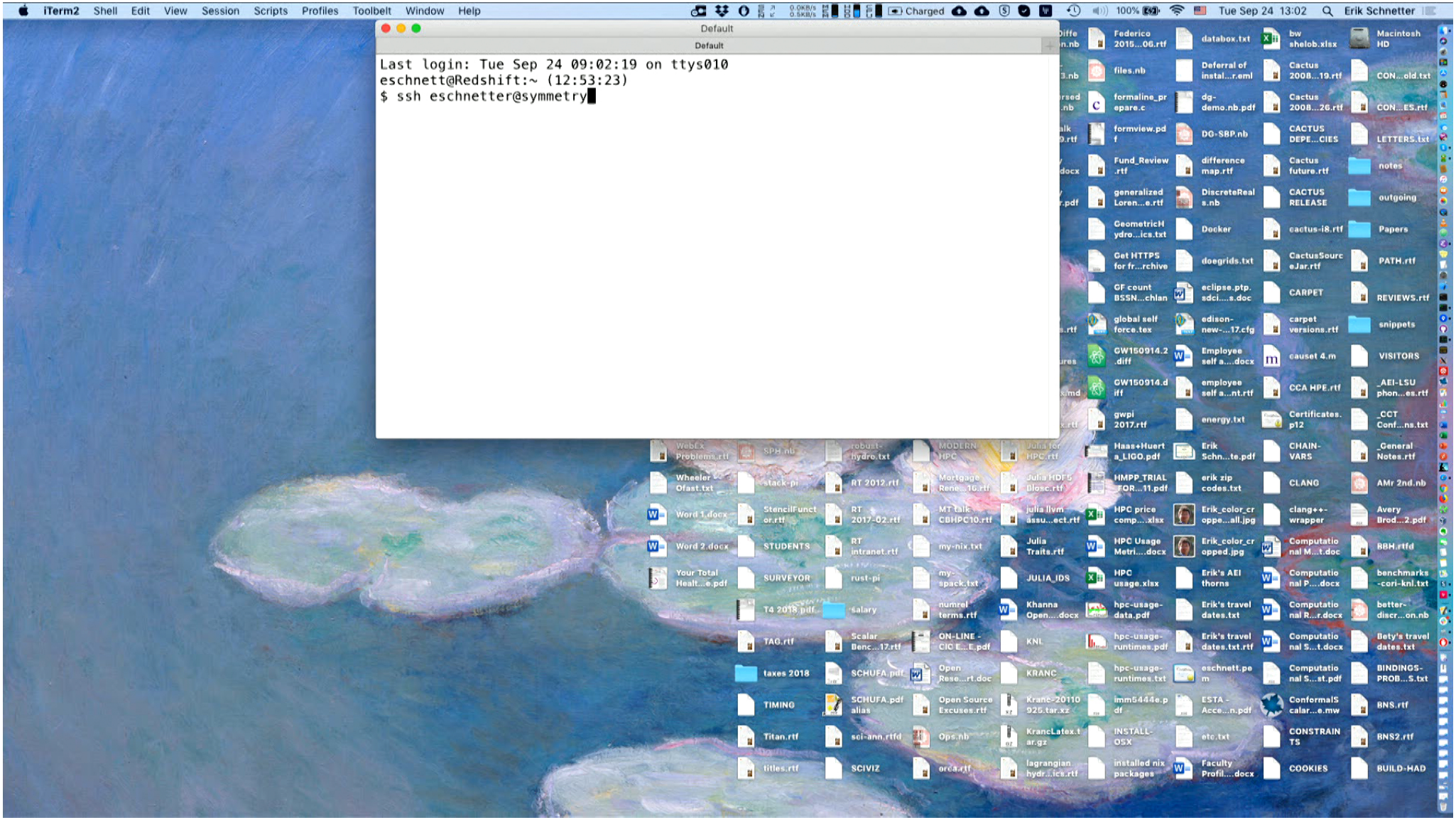
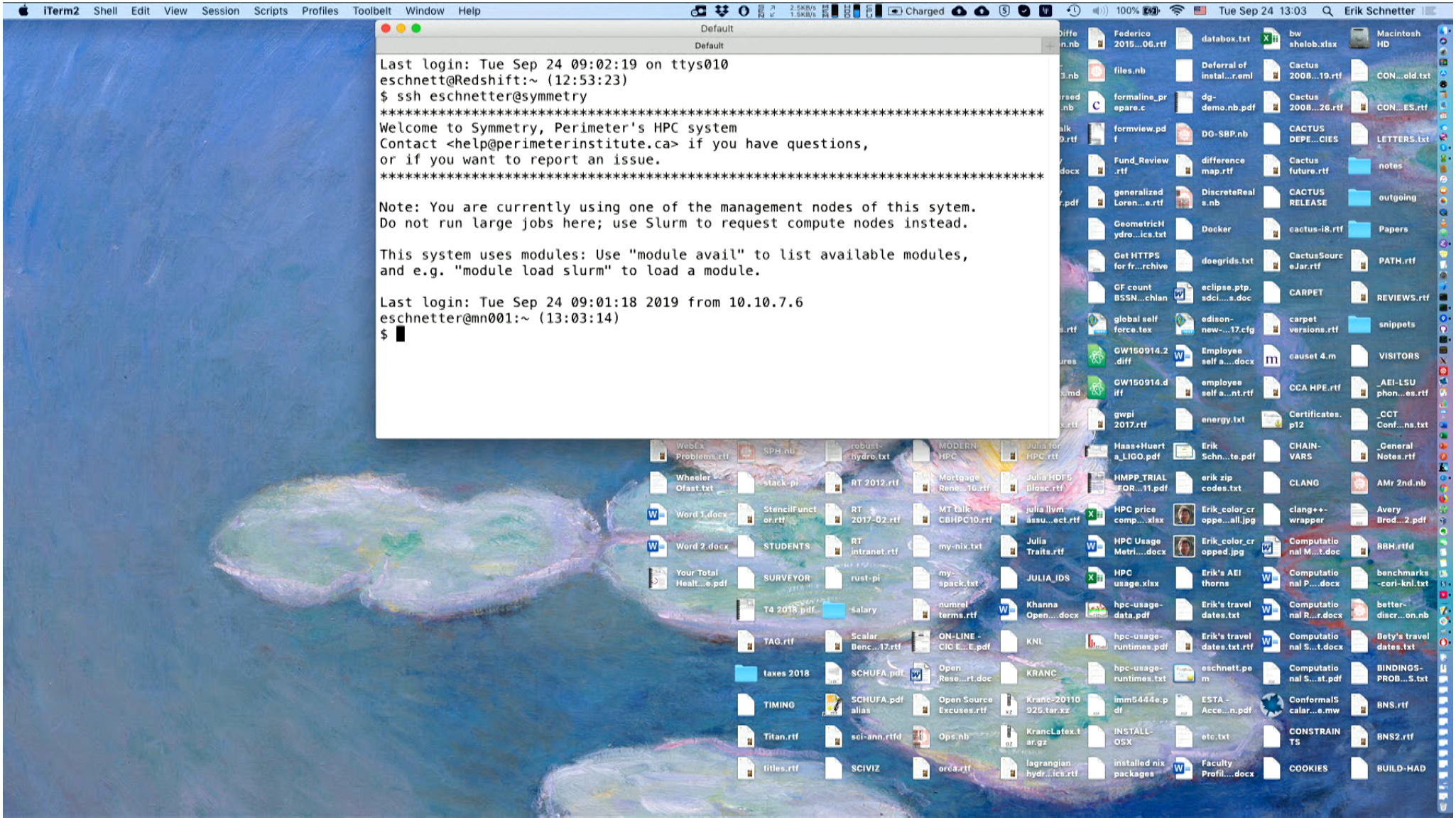
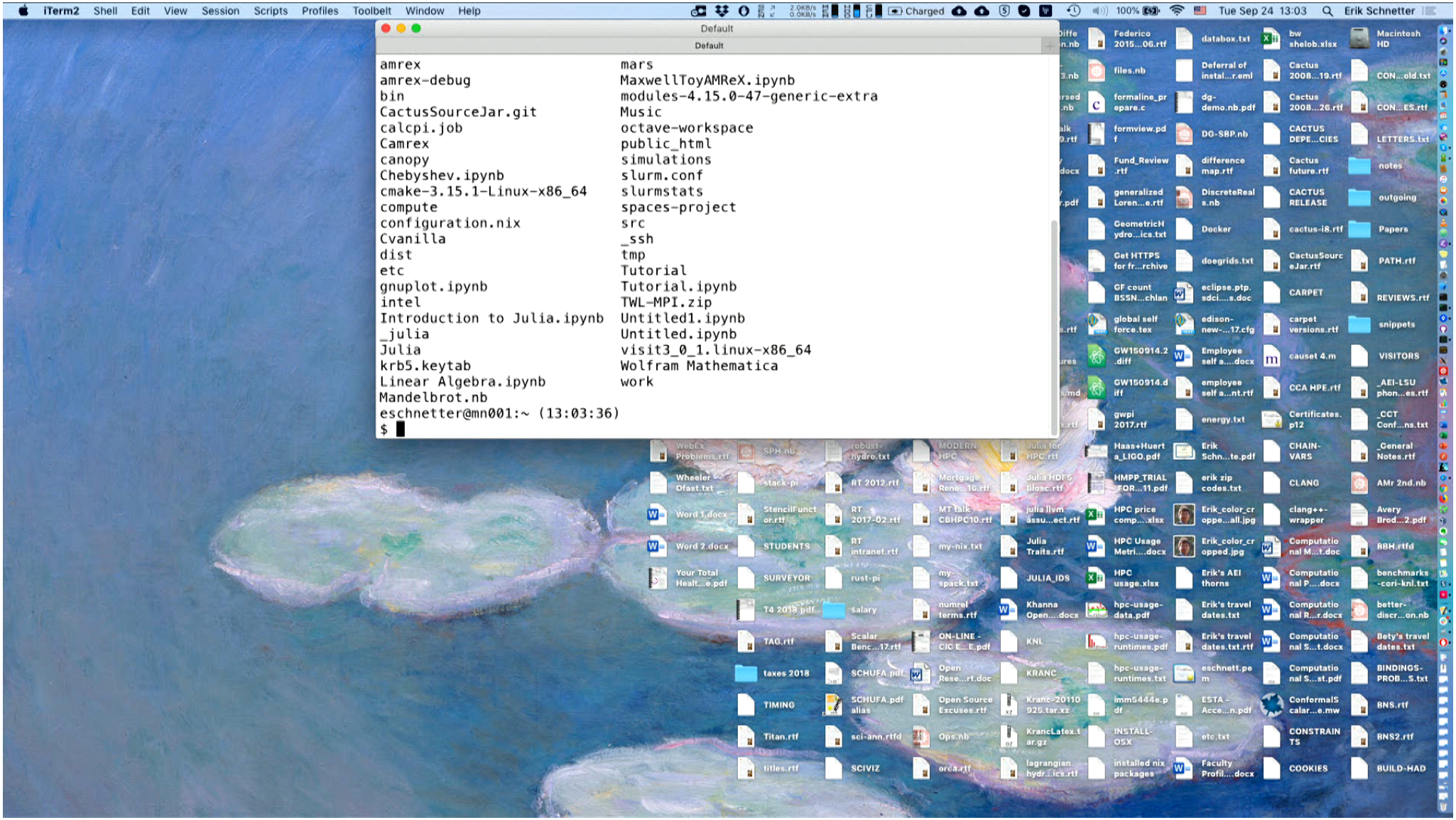
Title: Introduction to Symmetry

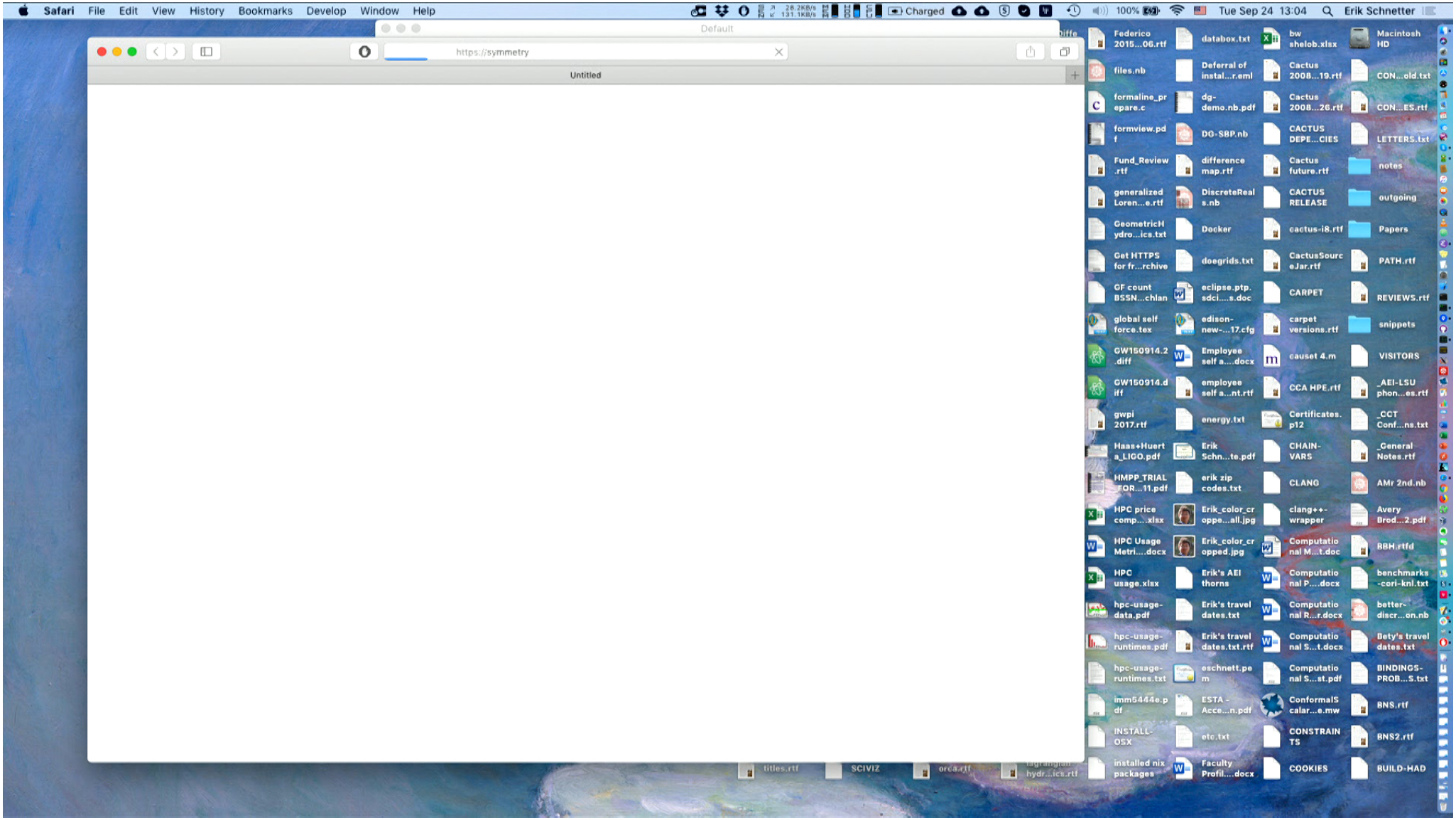
Speakers: Dustin Lang
Date: September 24, 2019 - 1:00 PM

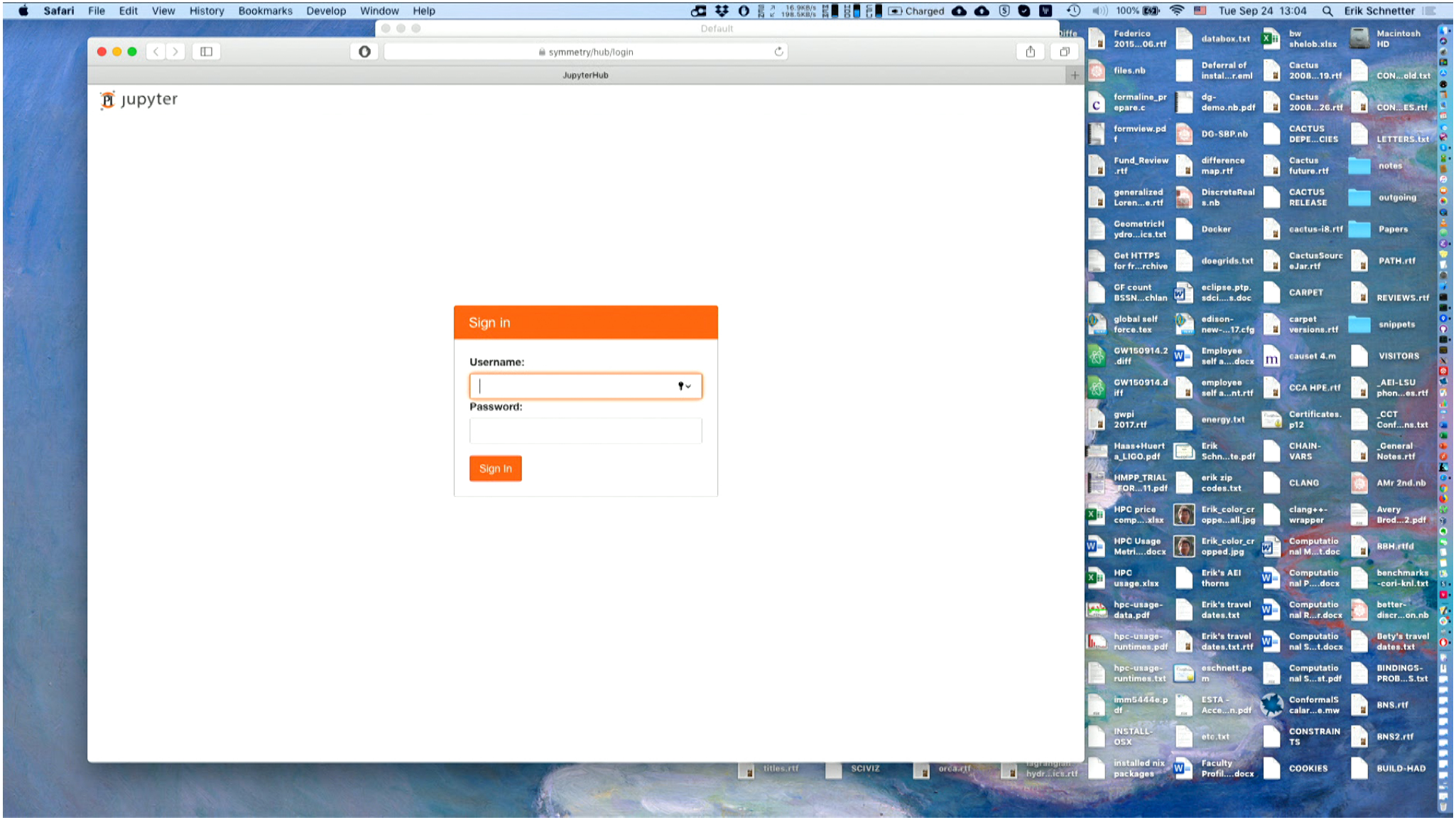
URL: http://pirsa.org/19090121

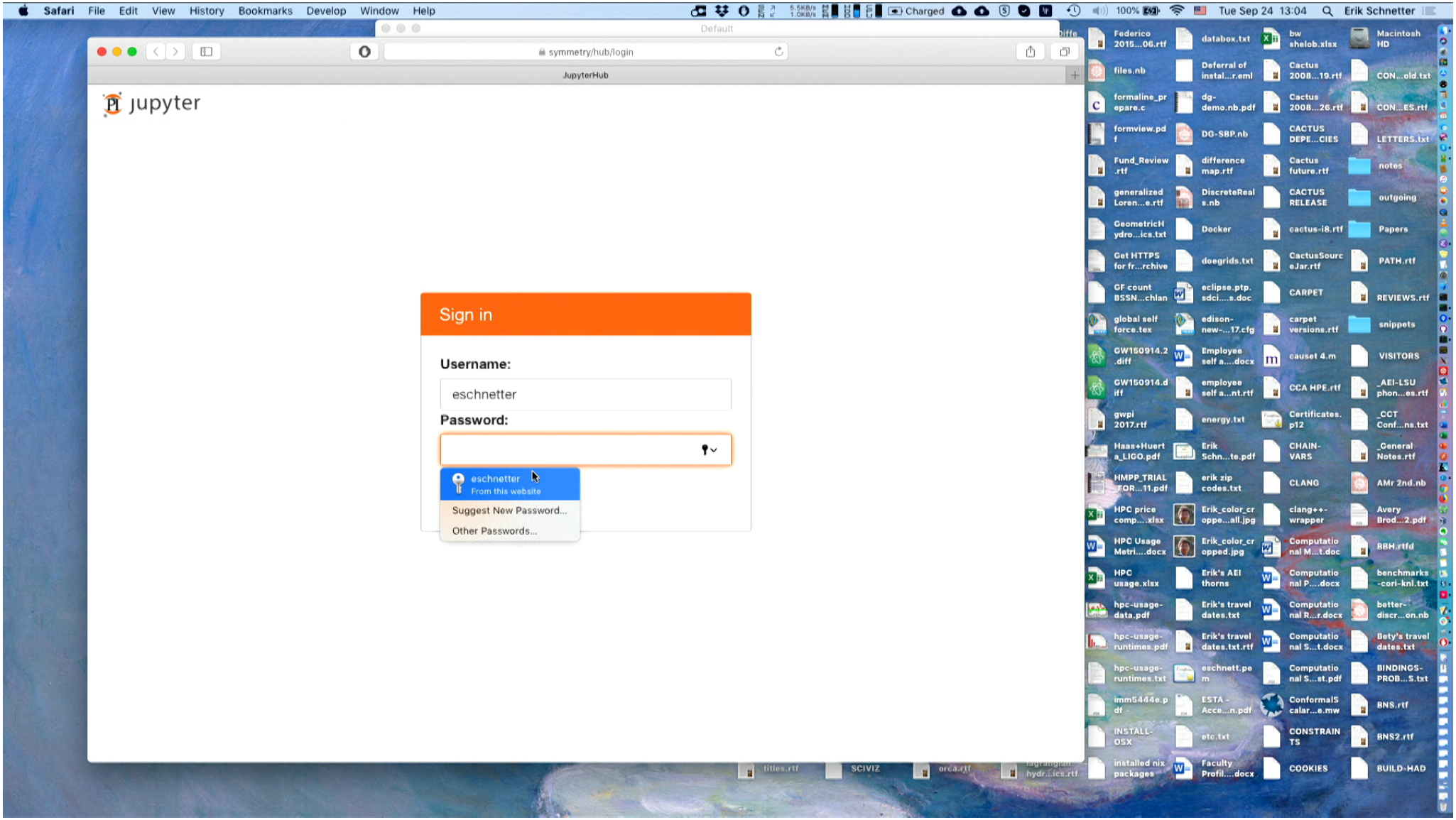

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged
Tue Sep 24 13:02
Erik Schnetter
Default
Default
Last login: Tue Sep 24 09:02:19 on ttys010
eschnett@Redshift:~ (12:53:23)
$ ssh eschnetter@symmetry

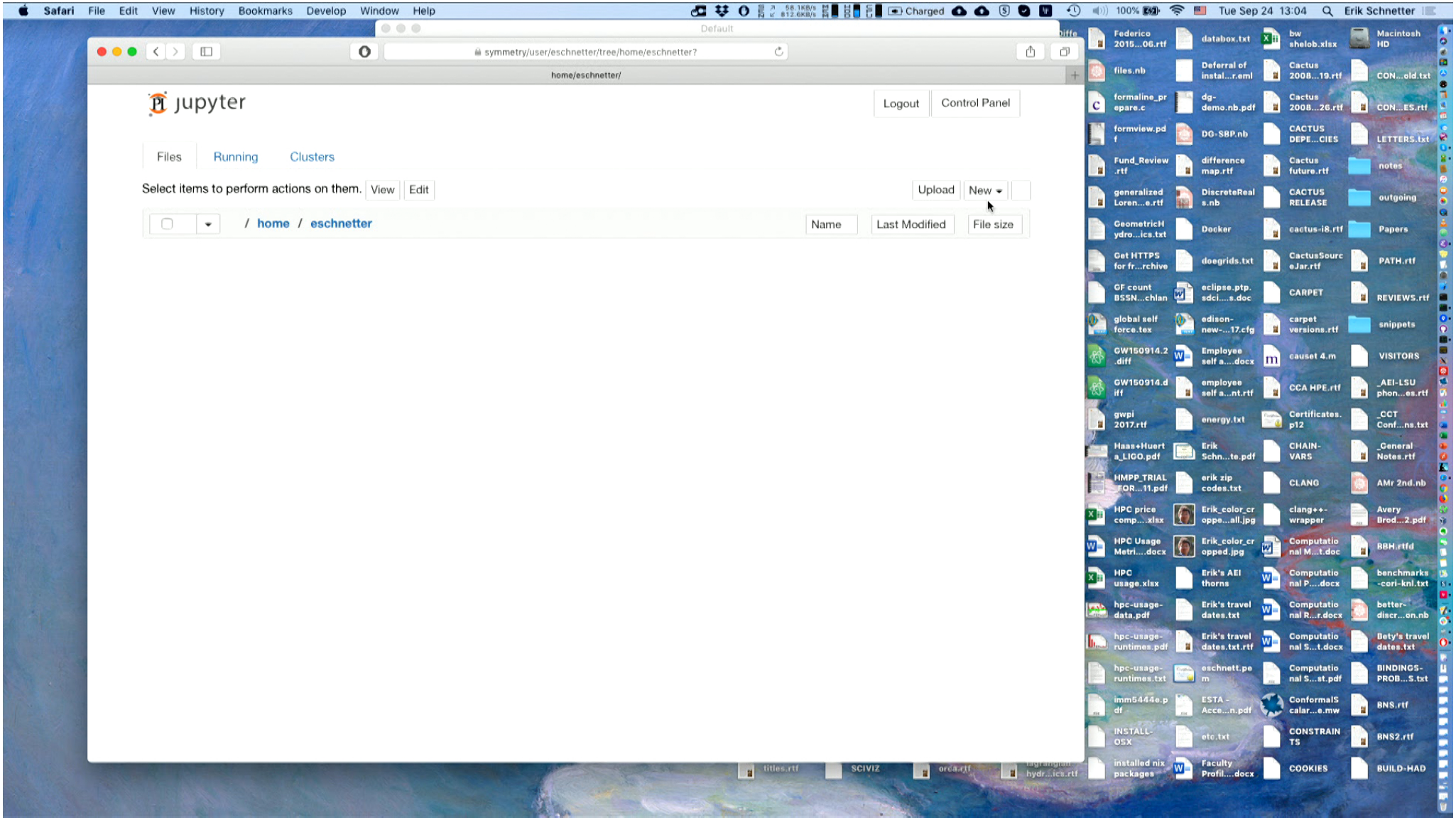

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged
Tue Sep 24 13:03
Erik Schnetter
Default
Default
Last login: Tue Sep 24 09:02:19 on ttys010
eschnett@Redshift:~ (12:53:23)
$ ssh eschnetter@symmetry
****
Welcome to Symmetry, Perimeter's HPC system
Contact <help@perimeterinstitute.ca> if you have questions,
or if you want to report an issue.
****
Note: You are currently using one of the management nodes of this sytem.
Do not run large jobs here; use Slurm to request compute nodes instead.
This system uses modules: Use "module avail" to list available modules,
and e.g. "module load slurm" to load a module.
Last login: Tue Sep 24 09:01:18 2019 from 10.10.7.6
eschnetter@mn001:~ (13:03:14)
$

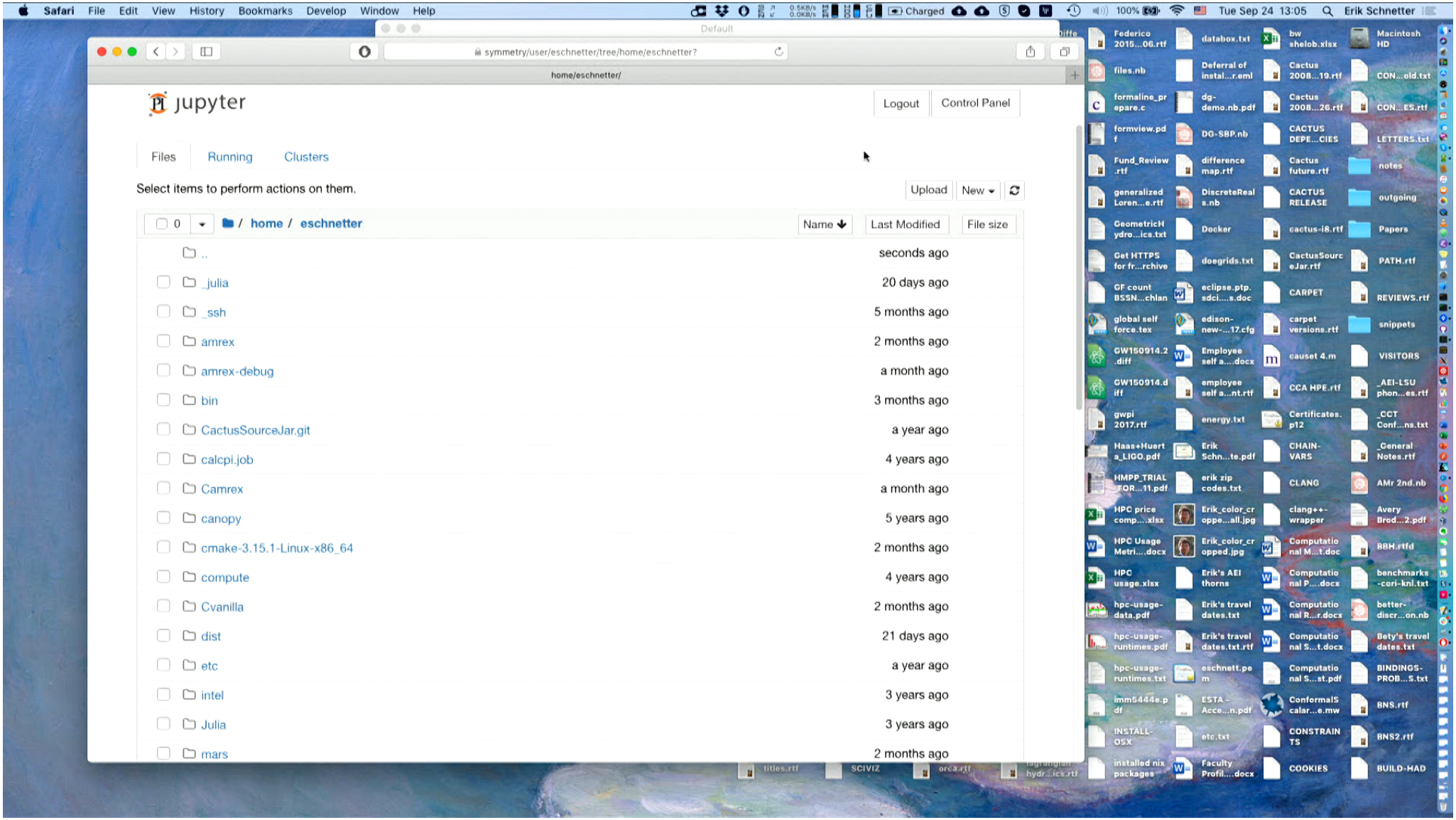

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged
Tue Sep 24 13:03
Erik Schnetter
Default
Default
amrex
amrex-debug
bin
CactusSourceJar.git
calcpi.job
Camrex
canopy
Chebyshev.ipynb
cmake-3.15.1-Linux-x86_64
compute
configuration.nix
Cvanilla
dist
etc
gnuplot.ipynb
intel
Introduction to Julia.ipynb
_julia
Julia
krb5.keytab
Linear Algebra.ipynb
Mandelbrot.nb
mars
MaxwellToyAMReX.ipynb
modules-4.15.0-47-generic-extra
Music
octave-workspace
public_html
simulations
slurm.conf
slurmstats
spaces-project
src
_ssh
tmp
Tutorial
Tutorial.ipynb
TWL-MPI.zip
Untitled1.ipynb
Untitled.ipynb
visit3_0_1.linux-x86_64
Wolfram Mathematica
work
eschnetter@mn001:~ (13:03:36)
$

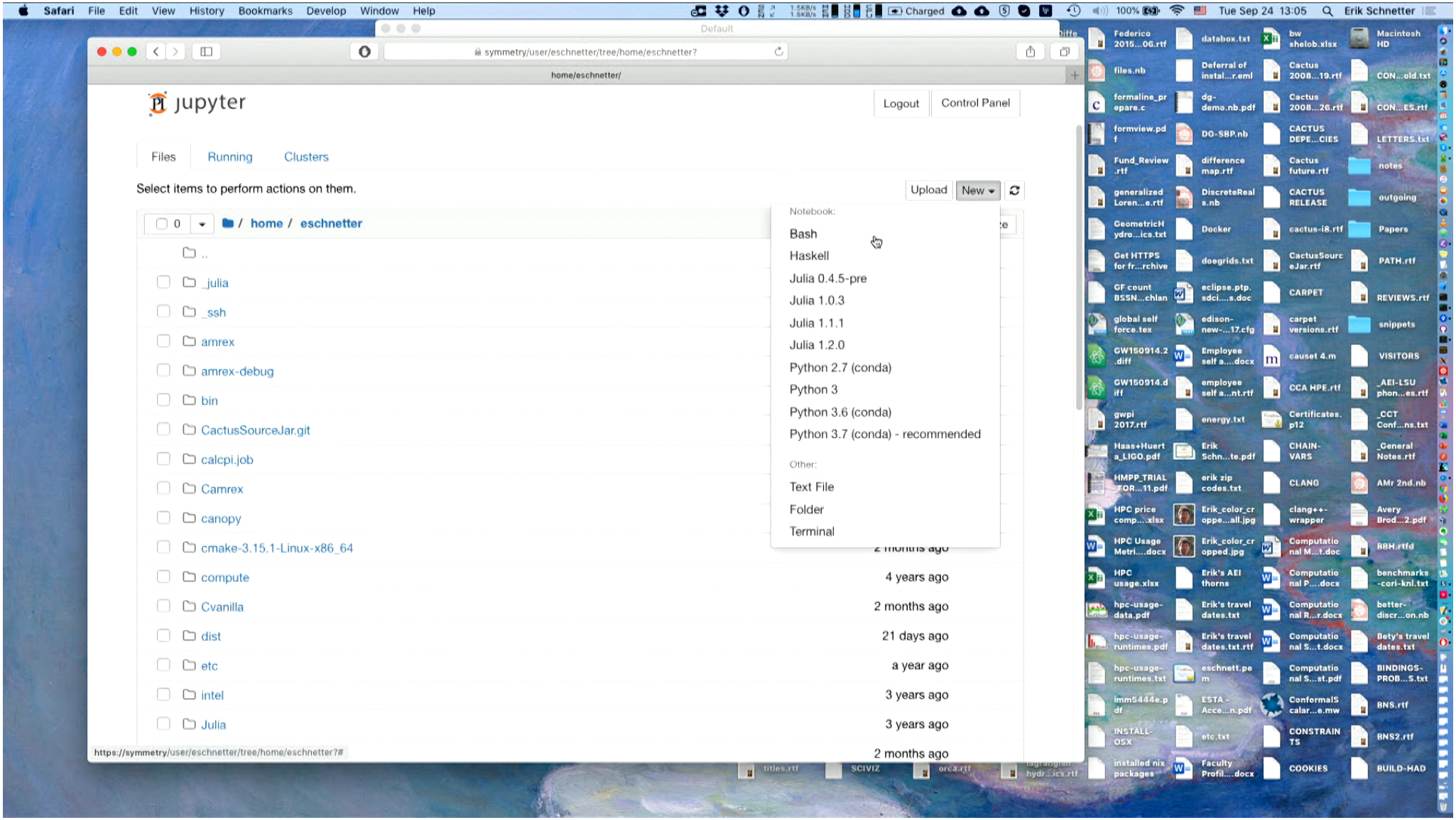

Safari File Edit View History Bookmarks Develop Window Help
Charged
100%
Tue Sep 24 13:04
Erik Schnetter
Default
https://symmetry
Untitled
Federico 2015...06.rtf
databox.txt
bw shelob.xlsx
Macintosh HD
files.nb
Deferral of instal...r.eml
Cactus 2008...19.rtf
CON...old.txt
formaline_prepare.c
dg-demo.nb.pdf
Cactus 2008...26.rtf
CON...ES.rtf
formview.pdf
DG-SBP.nb
CACTUS DEPE...CIES
LETTERS.txt
Fund_Review.rtf
difference map.rtf
Cactus future.rtf
notes
generalized Loren...e.rtf
DiscreteReals.nb
CACTUS RELEASE
outgoing
GeometricHydro...ics.txt
Docker
cactus-i8.rtf
Papers
Get HTTPS for fr...rchive
doegrids.txt
CactusSourceJar.rtf
PATH.rtf
GF count BSSN...chlan
eclipse.ptp.sdci....s.doc
CARPET
REVIEWS.rtf
global self force.tex
edison-new-...17.cfg
carpet versions.rtf
snippets
GW150914.2.diff
Employee self a....docx
causet 4.m
VISITORS
GW150914.diff
employee self a...nt.rtf
CCA HPE.rtf
_AEI-LSU phon...es.rtf
gwpi 2017.rtf
energy.txt
Certificates.p12
_CCT Conf...ns.txt
Haas+Huerta_LIGO.pdf
Erik Schn...te.pdf
CHAIN-VARS
_General Notes.rtf
HMPP_TRIAL_FOR...11.pdf
erik zip codes.txt
CLANG
AMr 2nd.nb
HPC price comp....xlsx
Erik_color_croppe...all.jpg
clang++-wrapper
Avery Brod...2.pdf
HPC Usage Metri....docx
Erik_color_cropped.jpg
Computational M...t.doc
88H.rtfd
HPC usage.xlsx
Erik's AEI thorns
Computational P....docx
benchmarks-cori-knl.txt
hpc-usage-data.pdf
Erik's travel dates.txt
Computational R...r.docx
better-discr...on.nb
hpc-usage-runtimes.pdf
Erik's travel dates.txt.rtf
Computational S...t.docx
Bety's travel dates.txt
hpc-usage-runtimes.txt
eschnett.pem
Computational S....st.pdf
BINDINGS-PROB...S.txt
imm5444e.pdf
ESTA - Acce....n.pdf
ConformalScalar...e.mw
BNS.rtf
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD
titles.rtf
SCIVIZ
orca.rtf

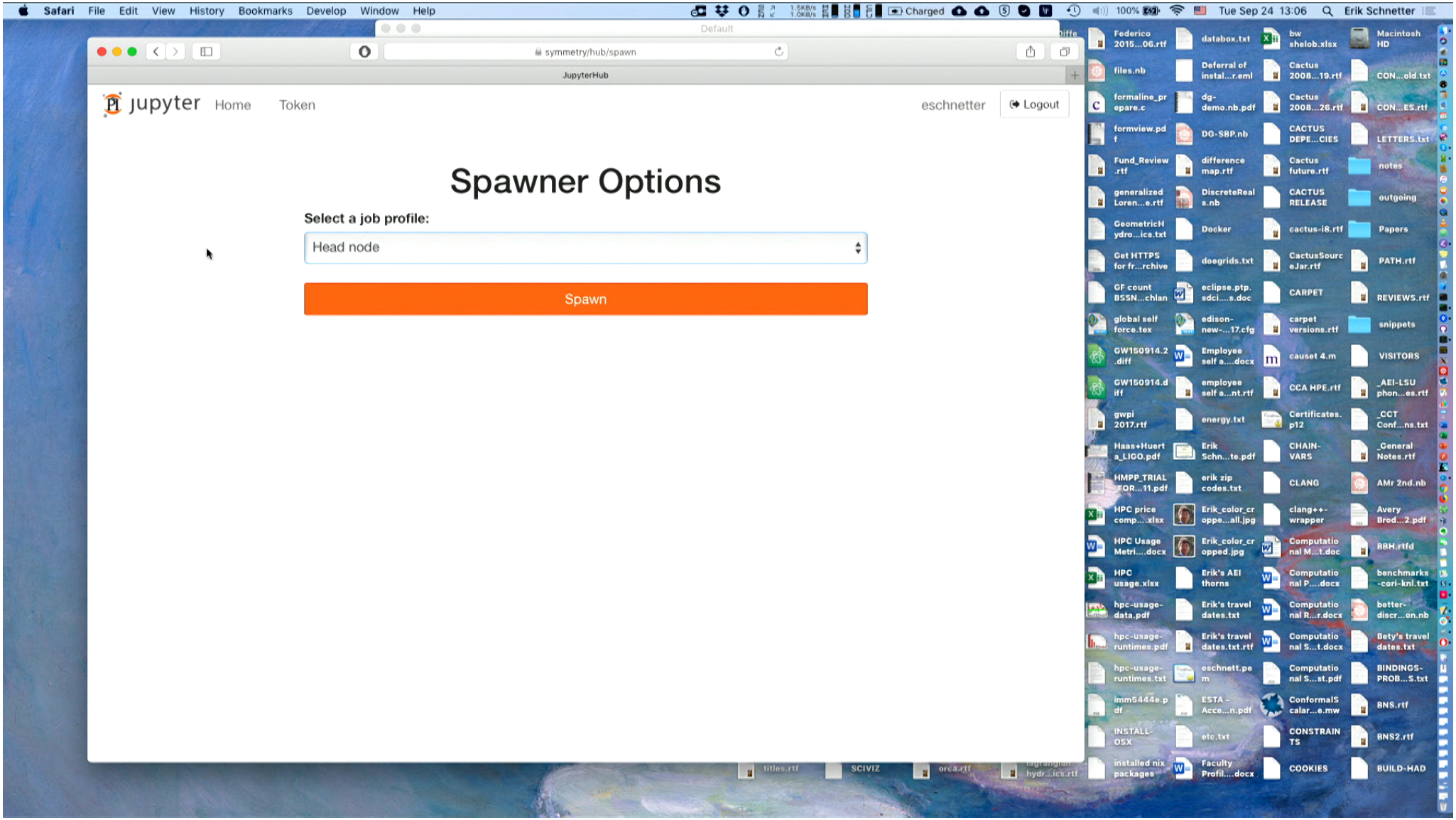

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:04
Erik Schnetter
symmetry/hub/login
JupyterHub
jupyter
Sign in
Username:
Password:
Sign In

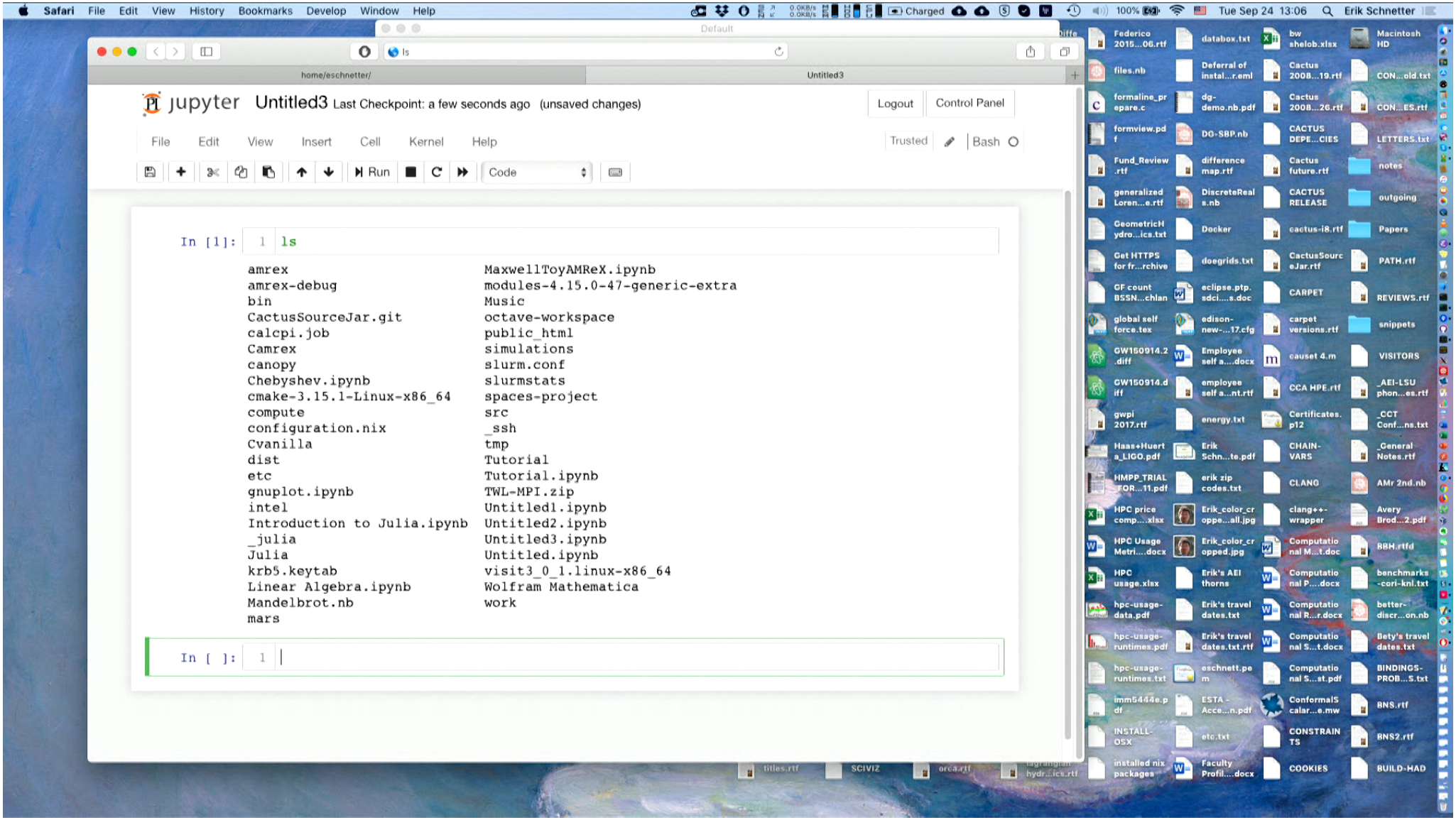

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:04
Erik Schnetter
symmetry/hub/login
JupyterHub
jupyter
Sign in
Username:
eschnetter
Password:
eschnetter
From this website
Suggest New Password...
Other Passwords...

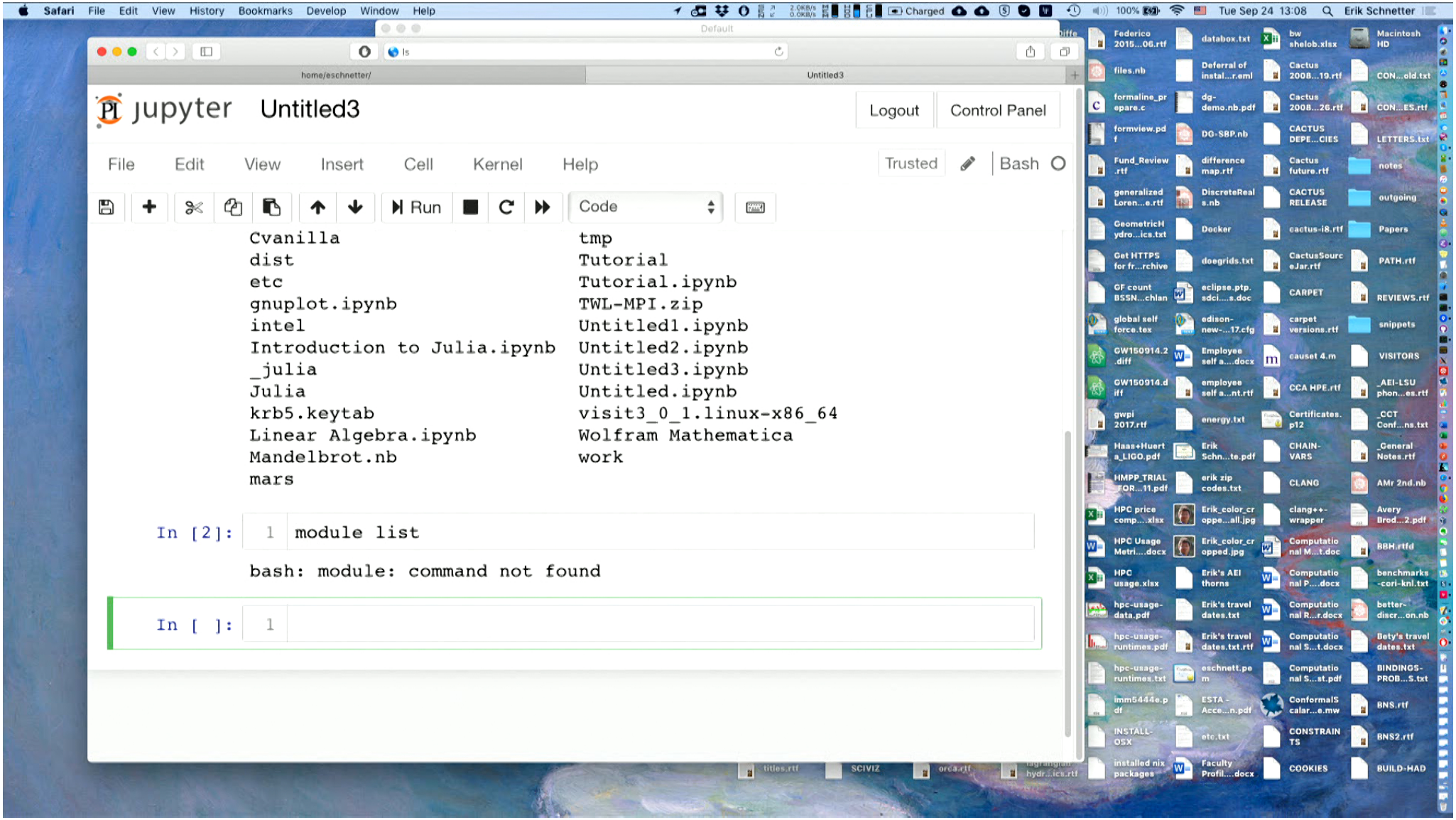

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:04 Erik Schnetter
symmetry/user/eschnetter/tree/home/eschnetter?
home/eschnetter/
jupyter
Logout
Control Panel
Files
Running
Clusters
Select items to perform actions on them.
View
Edit
Upload
New
/ home / eschnetter
Name
Last Modified
File size

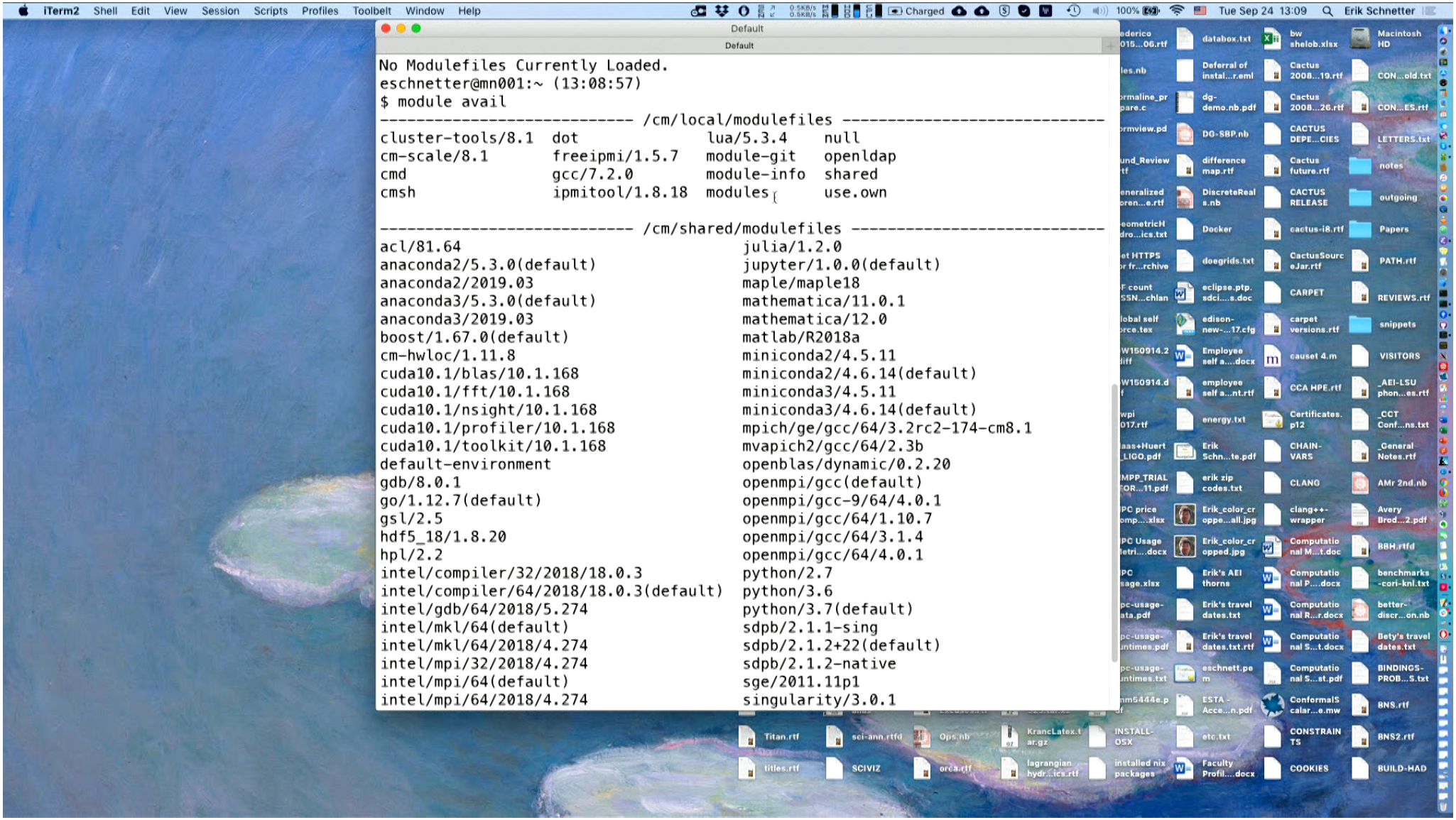

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:05
Erik Schnetter
symmetry/user/eschnetter/tree/home/eschnetter?
home/eschnetter/
jupyter
Logout
Control Panel
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
0
/ home / eschnetter
Name
Last Modified
File size
.. seconds ago
_julia 20 days ago
_ssh 5 months ago
amrex 2 months ago
amrex-debug a month ago
bin 3 months ago
CactusSourceJar.git a year ago
calcpi.job 4 years ago
Camrex a month ago
canopy 5 years ago
cmake-3.15.1-Linux-x86_64 2 months ago
compute 4 years ago
Cvanilla 2 months ago
dist 21 days ago
etc a year ago
intel 3 years ago
Julia 3 years ago
mars 2 months ago

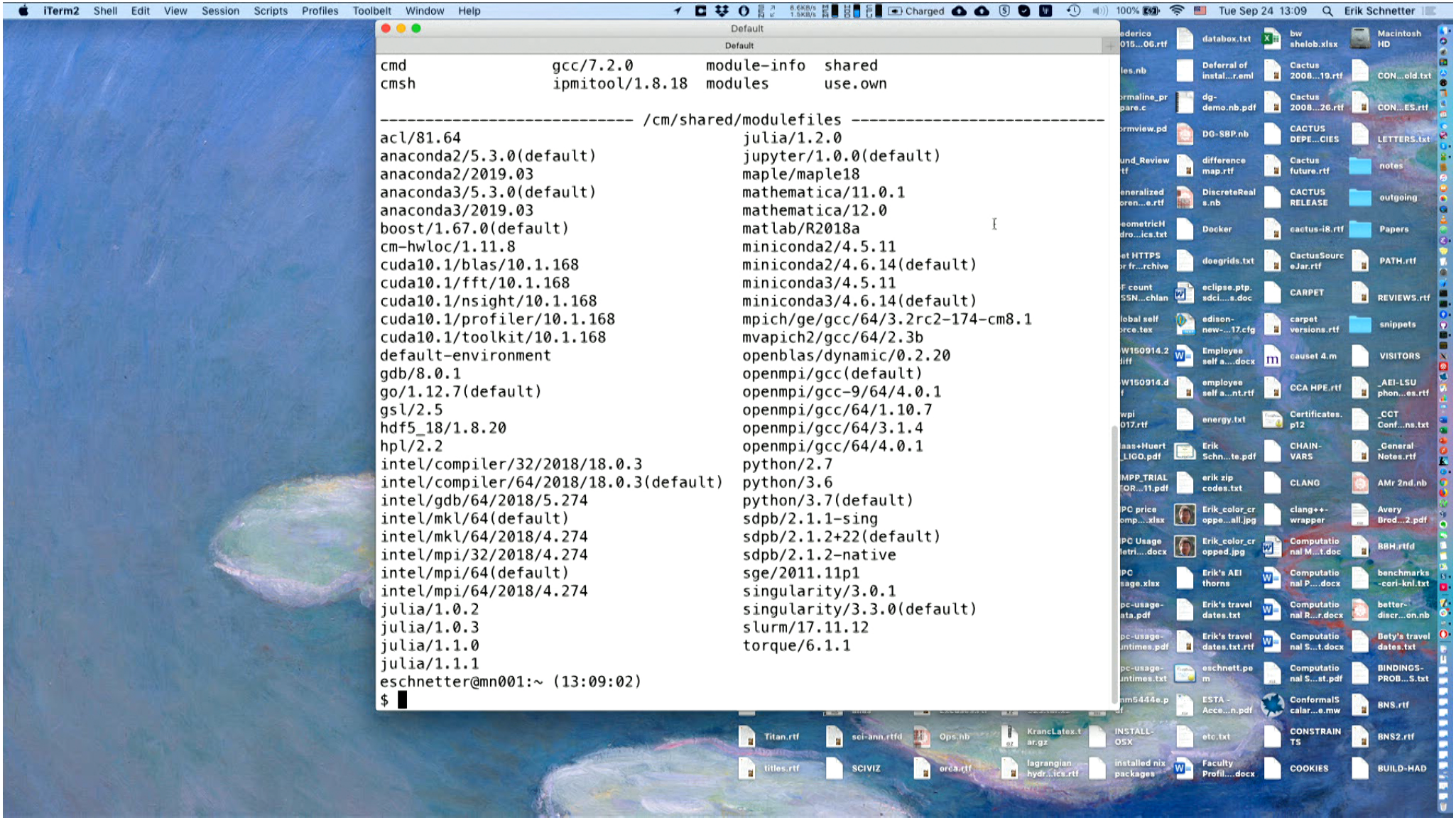

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:05
Erik Schnetter
symmetry/user/eschnetter/tree/home/eschnetter?
home/eschnetter/
jupyter
Logout
Control Panel
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
/ home / eschnetter
..
_julia
_ssh
amrex
amrex-debug
bin
CactusSourceJar.git
calcpi.job
Camrex
canopy
cmake-3.15.1-Linux-x86_64
compute
Cvanilla
dist
etc
intel
Julia
4 years ago
2 months ago
21 days ago
a year ago
3 years ago
3 years ago
2 months ago
Notebook:
Bash
Haskell
Julia 0.4.5-pre
Julia 1.0.3
Julia 1.1.1
Julia 1.2.0
Python 2.7 (conda)
Python 3
Python 3.6 (conda)
Python 3.7 (conda) - recommended
Other:
Text File
Folder
Terminal
https://symmetry/user/eschnetter/tree/home/eschnetter?#

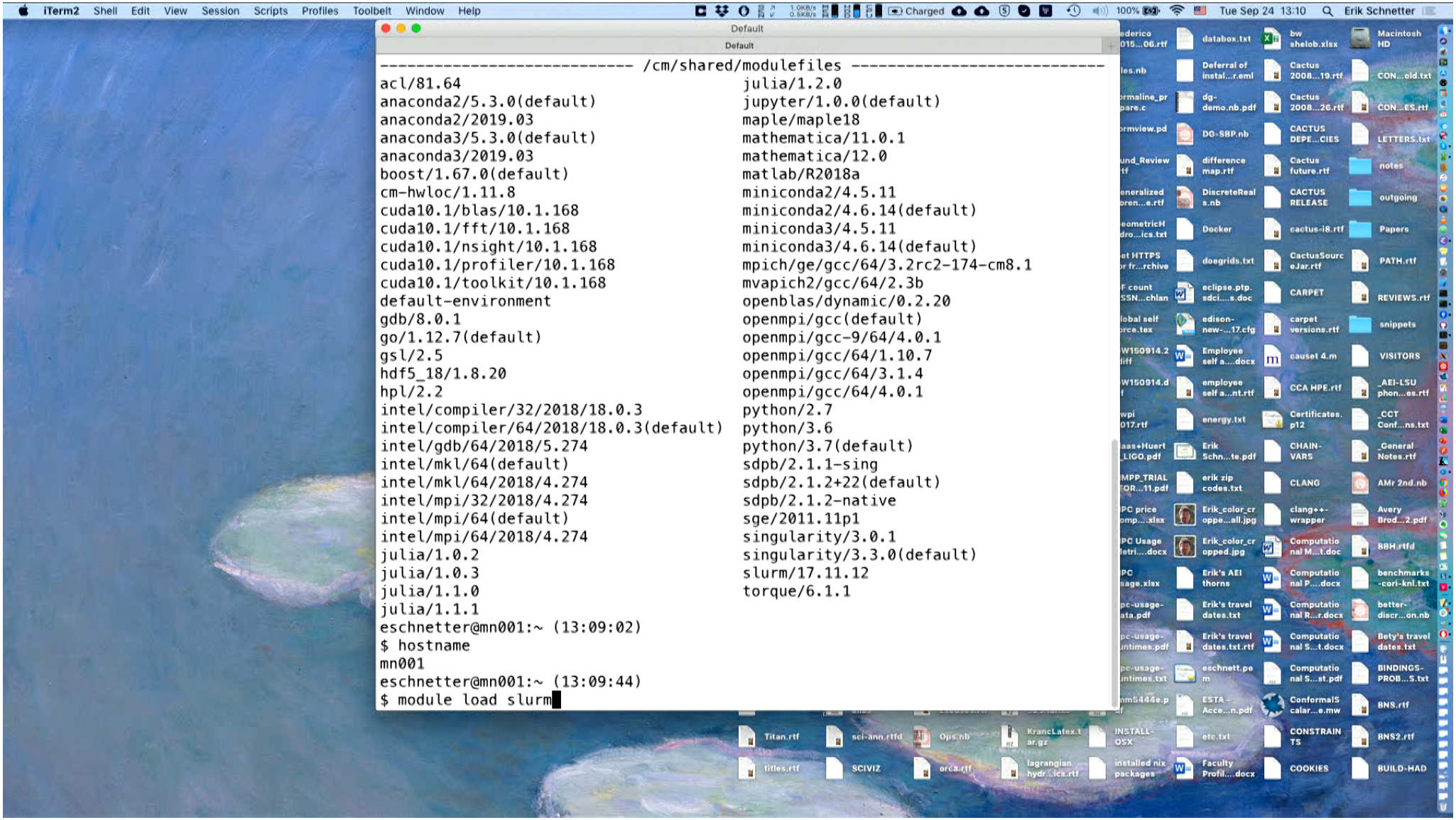

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:06
Erik Schnetter
symmetry/hub/spawn
JupyterHub
jupyter
Home
Token
eschnetter
Logout
Spawner Options
Select a job profile:
Head node
Spawn

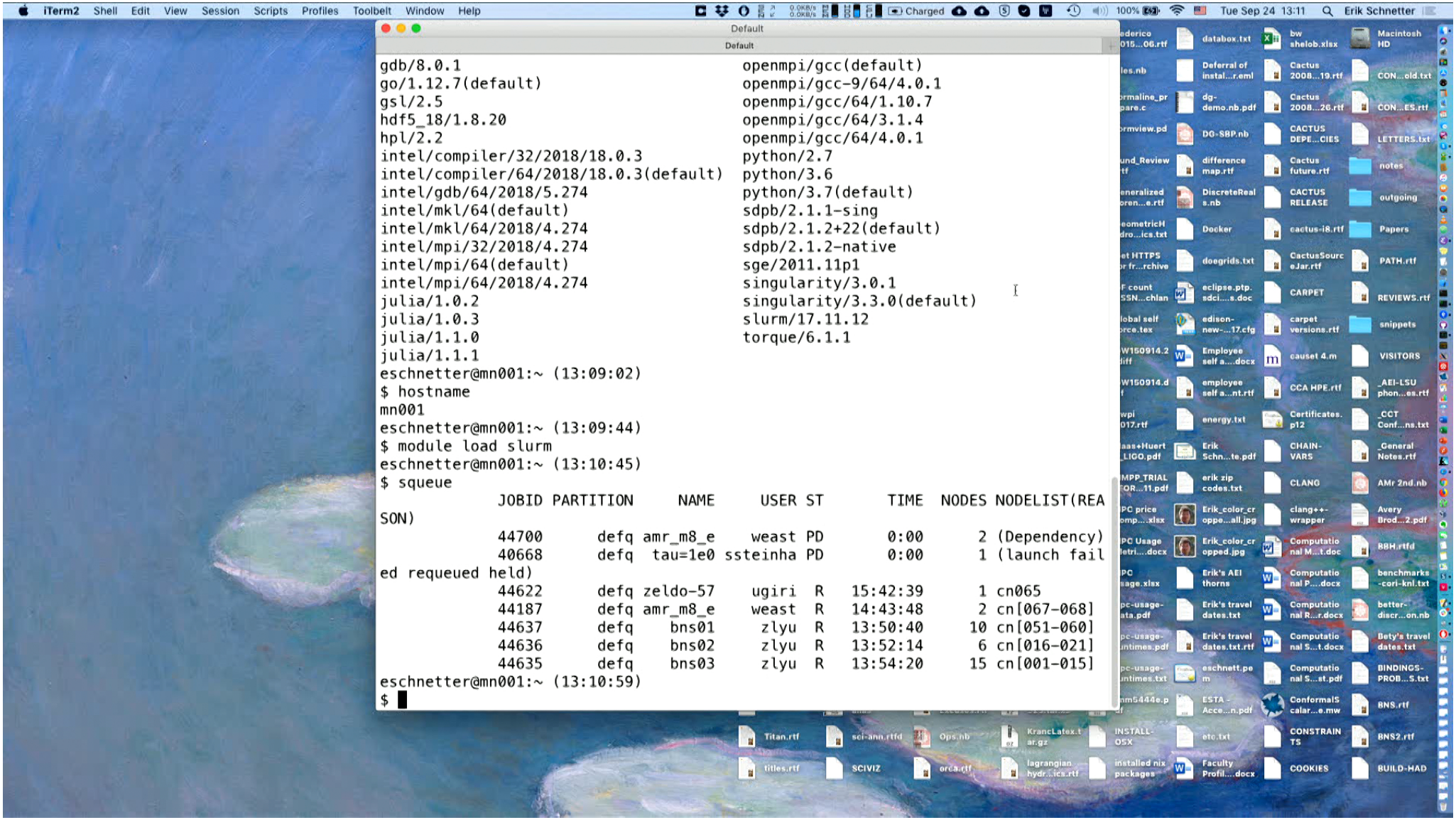

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:06 Erik Schnetter
home/eschnetter/
Untitled3
jupyter Untitled3 Last Checkpoint: a few seconds ago (unsaved changes)
Logout Control Panel
File Edit View Insert Cell Kernel Help
Trusted Bash
Run Code
In [1]: ls
amrex MaxwellToyAMReX.ipynb
amrex-debug modules-4.15.0-47-generic-extra
bin Music
CactusSourceJar.git octave-workspace
calcpi.job public_html
Camrex simulations
canopy slurm.conf
Chebyshev.ipynb slurmstats
cmake-3.15.1-Linux-x86_64 spaces-project
compute src
configuration.nix _ssh
Cvanilla tmp
dist Tutorial
etc Tutorial.ipynb
gnuplot.ipynb TWL-MPI.zip
intel Untitled1.ipynb
Introduction to Julia.ipynb Untitled2.ipynb
_julia Untitled3.ipynb
Julia Untitled.ipynb
krb5.keytab visit3_0_1.linux-x86_64
Linear Algebra.ipynb Wolfram Mathematica
Mandelbrot.nb work
mars
In [ ]:

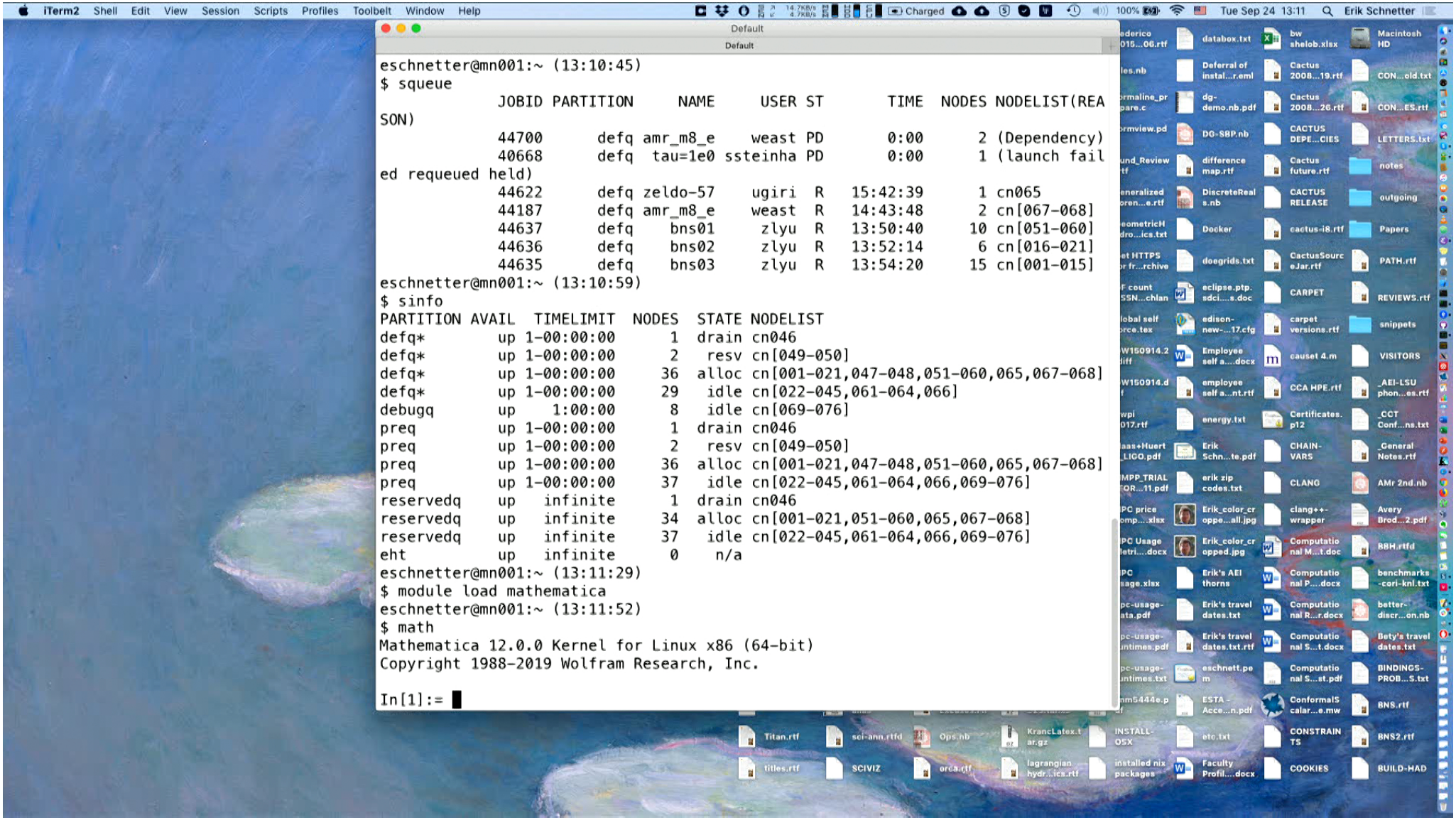

jupyter Untitled3
Logout
Control Panel
File Edit View Insert Cell Kernel Help
Trusted
Bash
Run
Code
Cvanilla
dist
etc
gnuplot.ipynb
intel
Introduction to Julia.ipynb
_julia
Julia
krb5.keytab
Linear Algebra.ipynb
Mandelbrot.nb
mars
tmp
Tutorial
Tutorial.ipynb
TWL-MPI.zip
Untitled1.ipynb
Untitled2.ipynb
Untitled3.ipynb
Untitled.ipynb
visit3_0_1.linux-x86_64
Wolfram Mathematica
work
In [2]: module list
bash: module: command not found
In [ ]:

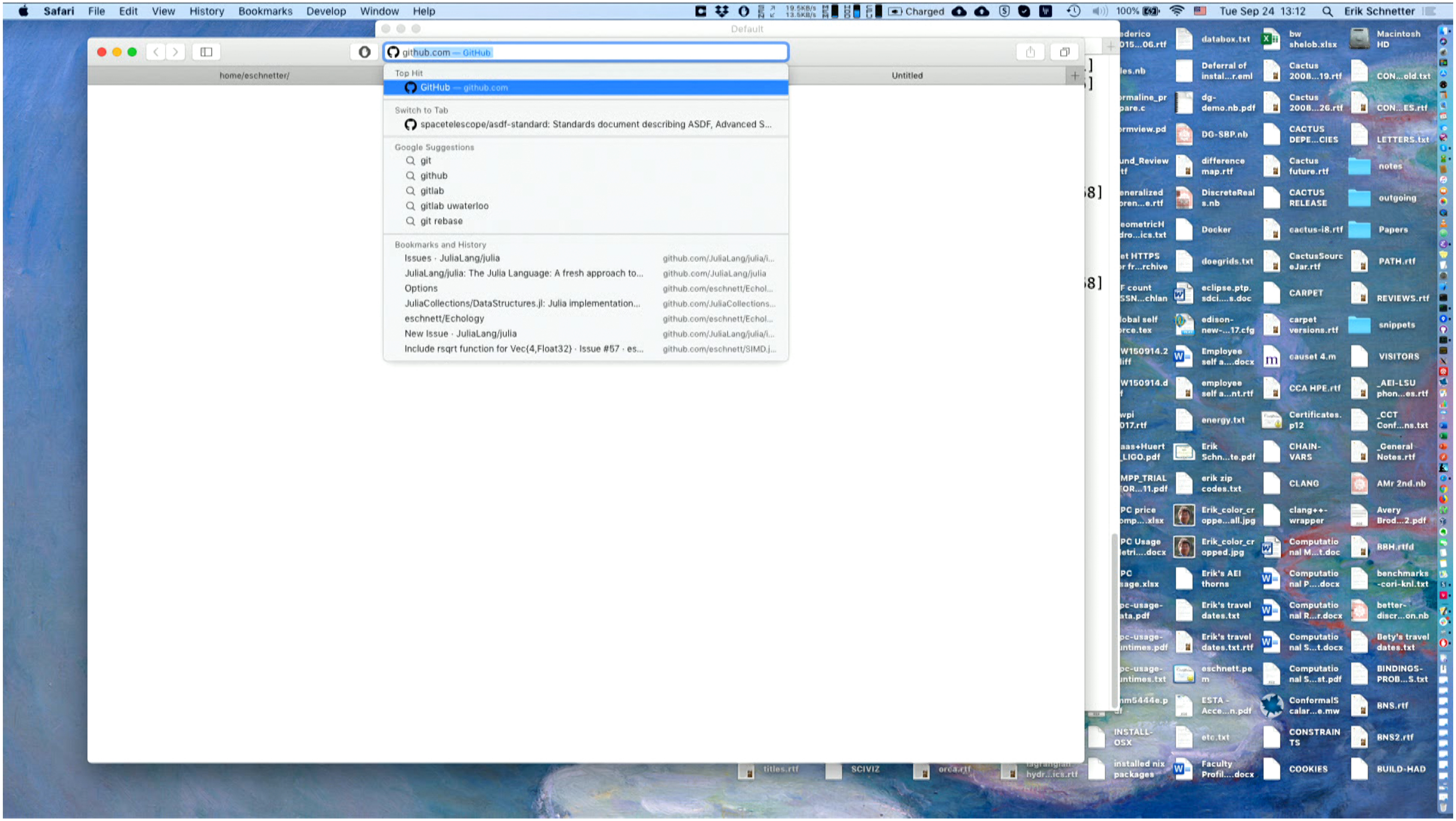

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged
Tue Sep 24 13:09
Erik Schnetter
Default
Default
No Modulefiles Currently Loaded.
eschnetter@mn001:~ (13:08:57)
$ module avail
/cm/local/modulefiles
cluster-tools/8.1 dot lua/5.3.4 null
cm-scale/8.1 freeipmi/1.5.7 module-git openldap
cmd gcc/7.2.0 module-info shared
cmsh ipmitool/1.8.18 modules use.own
/cm/shared/modulefiles
acl/81.64
anaconda2/5.3.0(default)
anaconda2/2019.03
anaconda3/5.3.0(default)
anaconda3/2019.03
boost/1.67.0(default)
cm-hwloc/1.11.8
cuda10.1/blas/10.1.168
cuda10.1/fft/10.1.168
cuda10.1/nsight/10.1.168
cuda10.1/profiler/10.1.168
cuda10.1/toolkit/10.1.168
default-environment
gdb/8.0.1
go/1.12.7(default)
gsl/2.5
hdf5_18/1.8.20
hpl/2.2
intel/compiler/32/2018/18.0.3
intel/compiler/64/2018/18.0.3(default)
intel/gdb/64/2018/5.274
intel/mkl/64(default)
intel/mkl/64/2018/4.274
intel/mpi/32/2018/4.274
intel/mpi/64(default)
intel/mpi/64/2018/4.274
julia/1.2.0
jupyter/1.0.0(default)
maple/maple18
mathematica/11.0.1
mathematica/12.0
matlab/R2018a
miniconda2/4.5.11
miniconda2/4.6.14(default)
miniconda3/4.5.11
miniconda3/4.6.14(default)
mpich/ge/gcc/64/3.2rc2-174-cm8.1
mvapich2/gcc/64/2.3b
openblas/dynamic/0.2.20
openmpi/gcc(default)
openmpi/gcc-9/64/4.0.1
openmpi/gcc/64/1.10.7
openmpi/gcc/64/3.1.4
openmpi/gcc/64/4.0.1
python/2.7
python/3.6
python/3.7(default)
sdpb/2.1.1-sing
sdpb/2.1.2+22(default)
sdpb/2.1.2-native
sge/2011.11p1
singularity/3.0.1

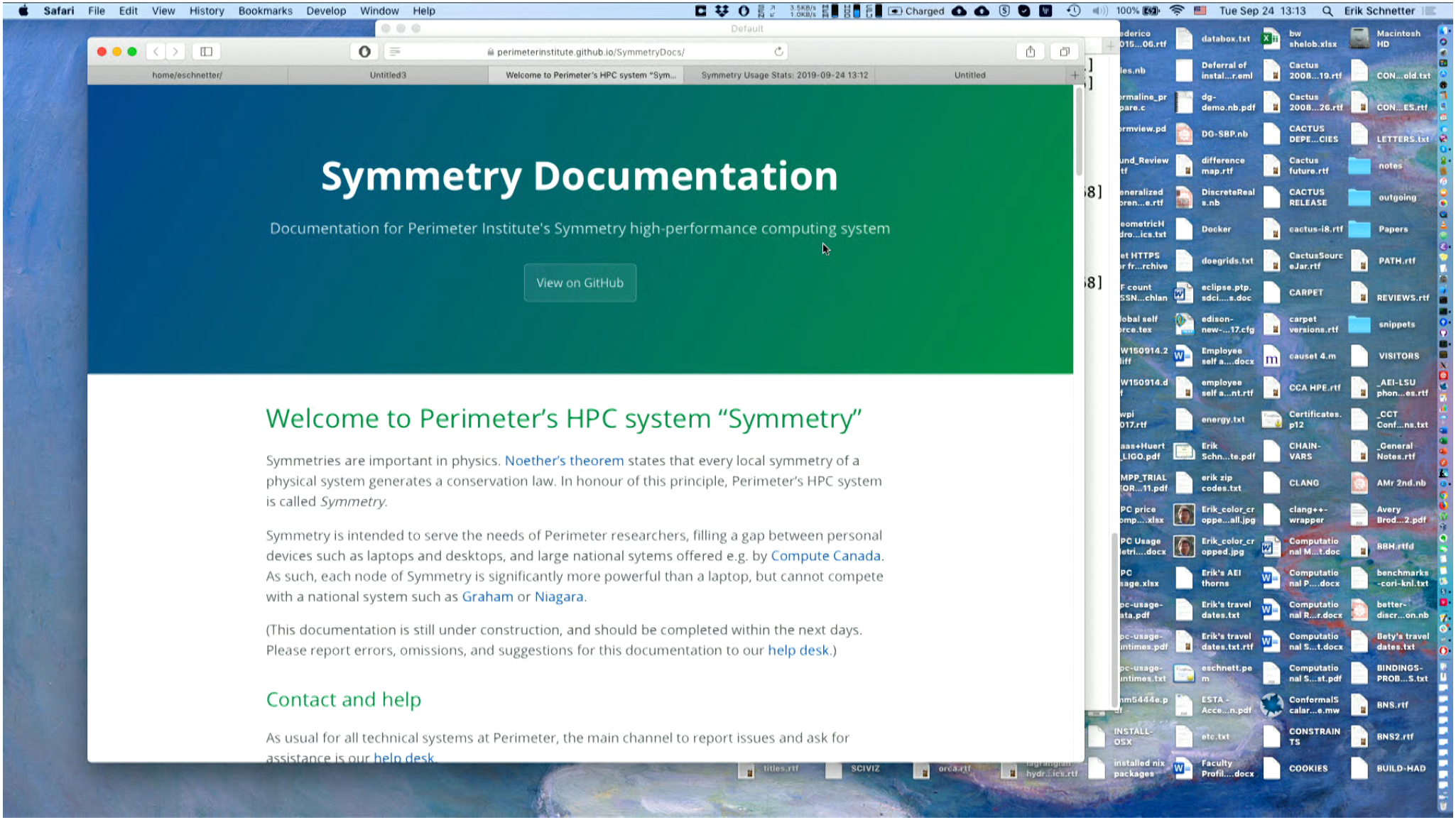

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:09
Erik Schnetter
Default
Default
cmd gcc/7.2.0 module-info shared
cmsh ipmitool/1.8.18 modules use.own
/cm/shared/modulefiles
acl/81.64
anaconda2/5.3.0(default)
anaconda2/2019.03
anaconda3/5.3.0(default)
anaconda3/2019.03
boost/1.67.0(default)
cm-hwloc/1.11.8
cuda10.1/blas/10.1.168
cuda10.1/fft/10.1.168
cuda10.1/nsight/10.1.168
cuda10.1/profiler/10.1.168
cuda10.1/toolkit/10.1.168
default-environment
gdb/8.0.1
go/1.12.7(default)
gsl/2.5
hdf5_18/1.8.20
hpl/2.2
intel/compiler/32/2018/18.0.3
intel/compiler/64/2018/18.0.3(default)
intel/gdb/64/2018/5.274
intel/mkl/64(default)
intel/mkl/64/2018/4.274
intel/mpi/32/2018/4.274
intel/mpi/64(default)
intel/mpi/64/2018/4.274
julia/1.0.2
julia/1.0.3
julia/1.1.0
julia/1.1.1
julia/1.2.0
jupyter/1.0.0(default)
maple/maple18
mathematica/11.0.1
mathematica/12.0
matlab/R2018a
miniconda2/4.5.11
miniconda2/4.6.14(default)
miniconda3/4.5.11
miniconda3/4.6.14(default)
mpich/ge/gcc/64/3.2rc2-174-cm8.1
mvapich2/gcc/64/2.3b
openblas/dynamic/0.2.20
openmpi/gcc(default)
openmpi/gcc-9/64/4.0.1
openmpi/gcc/64/1.10.7
openmpi/gcc/64/3.1.4
openmpi/gcc/64/4.0.1
python/2.7
python/3.6
python/3.7(default)
sdpb/2.1.1-sing
sdpb/2.1.2+22(default)
sdpb/2.1.2-native
sge/2011.11p1
singularity/3.0.1
singularity/3.3.0(default)
slurm/17.11.12
torque/6.1.1
eschnetter@mn001:~ (13:09:02)
$


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:10
Erik Schnetter
Default
Default
---------- /cm/shared/modulefiles ----------
acl/81.64
anaconda2/5.3.0(default)
anaconda2/2019.03
anaconda3/5.3.0(default)
anaconda3/2019.03
boost/1.67.0(default)
cm-hwloc/1.11.8
cuda10.1/blas/10.1.168
cuda10.1/fft/10.1.168
cuda10.1/nsight/10.1.168
cuda10.1/profiler/10.1.168
cuda10.1/toolkit/10.1.168
default-environment
gdb/8.0.1
go/1.12.7(default)
gsl/2.5
hdf5_18/1.8.20
hpl/2.2
intel/compiler/32/2018/18.0.3
intel/compiler/64/2018/18.0.3(default)
intel/gdb/64/2018/5.274
intel/mkl/64(default)
intel/mkl/64/2018/4.274
intel/mpi/32/2018/4.274
intel/mpi/64(default)
intel/mpi/64/2018/4.274
julia/1.0.2
julia/1.0.3
julia/1.1.0
julia/1.1.1
julia/1.2.0
jupyter/1.0.0(default)
maple/maple18
mathematica/11.0.1
mathematica/12.0
matlab/R2018a
miniconda2/4.5.11
miniconda2/4.6.14(default)
miniconda3/4.5.11
miniconda3/4.6.14(default)
mpich/ge/gcc/64/3.2rc2-174-cm8.1
mvapich2/gcc/64/2.3b
openblas/dynamic/0.2.20
openmpi/gcc(default)
openmpi/gcc-9/64/4.0.1
openmpi/gcc/64/1.10.7
openmpi/gcc/64/3.1.4
openmpi/gcc/64/4.0.1
python/2.7
python/3.6
python/3.7(default)
sdpb/2.1.1-sing
sdpb/2.1.2+22(default)
sdpb/2.1.2-native
sge/2011.11p1
singularity/3.0.1
singularity/3.3.0(default)
slurm/17.11.12
torque/6.1.1
eschnetter@mn001:~ (13:09:02)
$ hostname
mn001
eschnetter@mn001:~ (13:09:44)
$ module load slurm


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:11
Erik Schnetter
Default
Default
gdb/8.0.1 openmpi/gcc(default)
go/1.12.7(default) openmpi/gcc-9/64/4.0.1
gsl/2.5 openmpi/gcc/64/1.10.7
hdf5_18/1.8.20 openmpi/gcc/64/3.1.4
hpl/2.2 openmpi/gcc/64/4.0.1
intel/compiler/32/2018/18.0.3 python/2.7
intel/compiler/64/2018/18.0.3(default) python/3.6
intel/gdb/64/2018/5.274 python/3.7(default)
intel/mkl/64(default) sdpb/2.1.1-sing
intel/mkl/64/2018/4.274 sdpb/2.1.2+22(default)
intel/mpi/32/2018/4.274 sdpb/2.1.2-native
intel/mpi/64(default) sge/2011.11p1
intel/mpi/64/2018/4.274 singularity/3.0.1
julia/1.0.2 singularity/3.3.0(default)
julia/1.0.3 slurm/17.11.12
julia/1.1.0 torque/6.1.1
julia/1.1.1
eschnetter@mn001:~ (13:09:02)
$ hostname
mn001
eschnetter@mn001:~ (13:09:44)
$ module load slurm
eschnetter@mn001:~ (13:10:45)
$ squeue
JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)
44700 defq amr_m8_e weast PD 0:00 2 (Dependency)
40668 defq tau=1e0 ssteinha PD 0:00 1 (launch failed requeued held)
44622 defq zeldo-57 ugiri R 15:42:39 1 cn065
44187 defq amr_m8_e weast R 14:43:48 2 cn[067-068]
44637 defq bns01 zlyu R 13:50:40 10 cn[051-060]
44636 defq bns02 zlyu R 13:52:14 6 cn[016-021]
44635 defq bns03 zlyu R 13:54:20 15 cn[001-015]
eschnetter@mn001:~ (13:10:59)
$

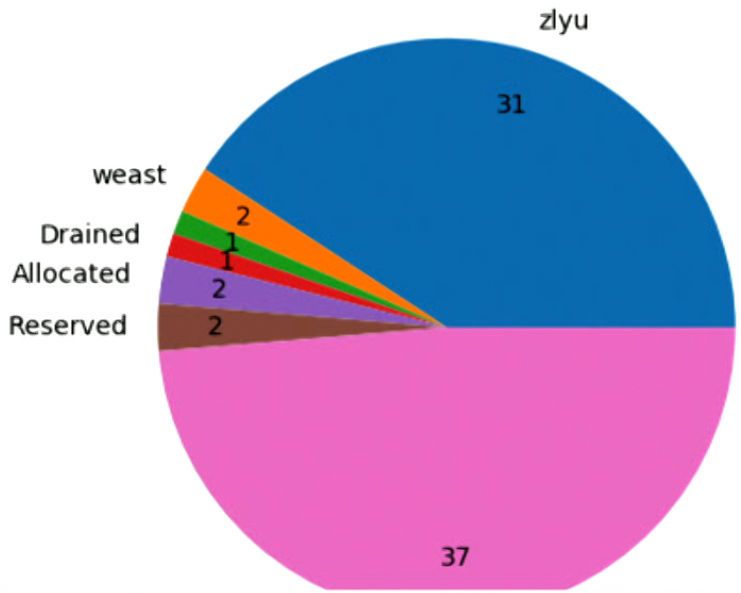

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:11
Erik Schnetter
Default
Default
eschnetter@mn001:~ (13:10:45)
$ squeue
JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)
44700 defq amr_m8_e weast PD 0:00 2 (Dependency)
40668 defq tau=1e0 ssteinha PD 0:00 1 (launch failed requeued held)
44622 defq zeldo-57 ugiri R 15:42:39 1 cn065
44187 defq amr_m8_e weast R 14:43:48 2 cn[067-068]
44637 defq bns01 zlyu R 13:50:40 10 cn[051-060]
44636 defq bns02 zlyu R 13:52:14 6 cn[016-021]
44635 defq bns03 zlyu R 13:54:20 15 cn[001-015]
eschnetter@mn001:~ (13:10:59)
$ sinfo
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
defq* up 1-00:00:00 1 drain cn046
defq* up 1-00:00:00 2 resv cn[049-050]
defq* up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
defq* up 1-00:00:00 29 idle cn[022-045,061-064,066]
debugq up 1:00:00 8 idle cn[069-076]
preq up 1-00:00:00 1 drain cn046
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 37 idle cn[022-045,061-064,066,069-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
eht up infinite 0 n/a
eschnetter@mn001:~ (13:11:29)
$ module load mathematica
eschnetter@mn001:~ (13:11:52)
$ math
Mathematica 12.0.0 Kernel for Linux x86 (64-bit)
Copyright 1988-2019 Wolfram Research, Inc.
In[1]:=

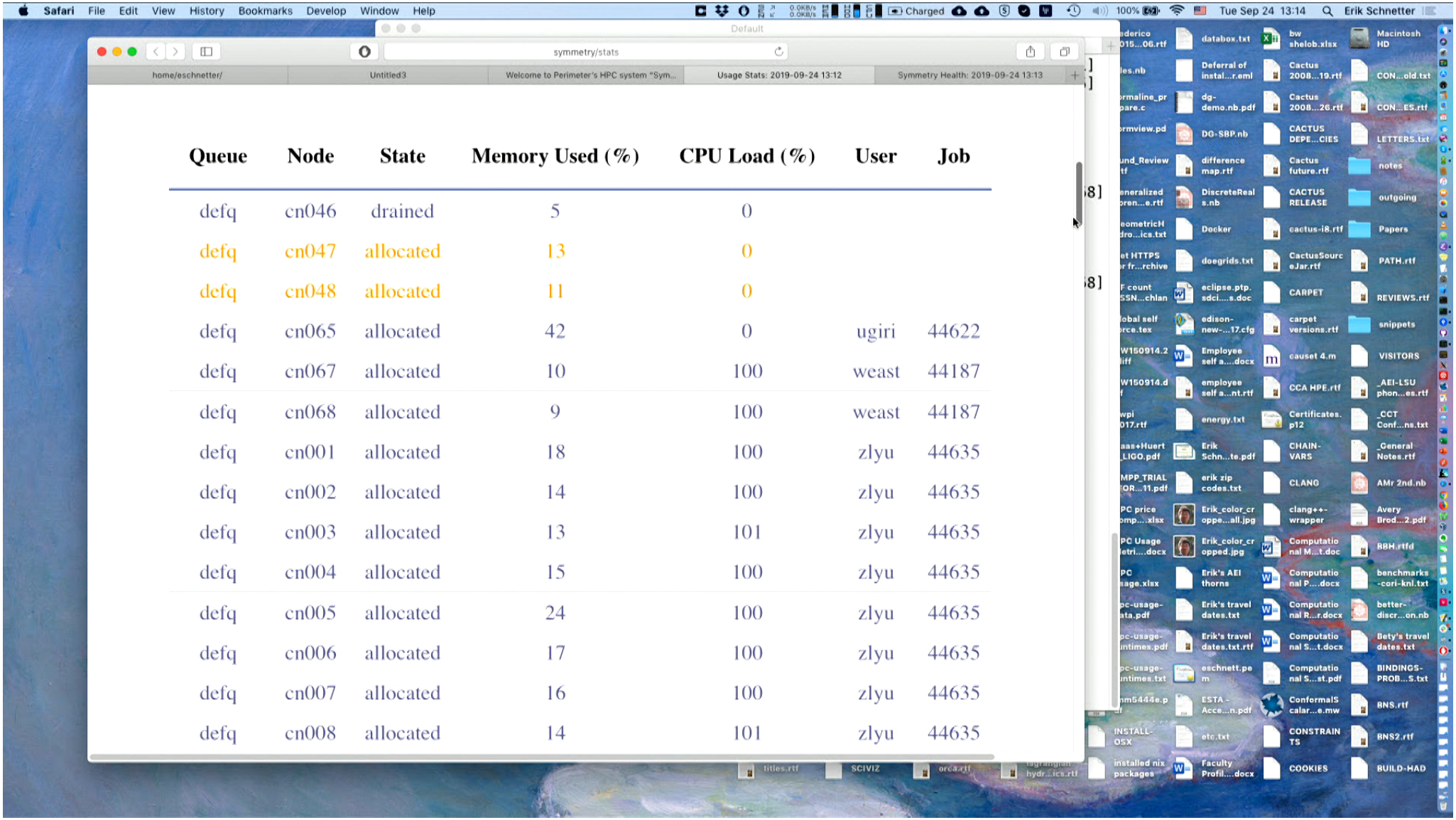

Safari File Edit View History Bookmarks Develop Window Help
Charged
100%
Tue Sep 24 13:12
Erik Schnetter
home/eschnetter/
Untitled
github.com — GitHub
Top Hit
GitHub — github.com
Switch to Tab
spacetelescope/asdf-standard: Standards document describing ASDF, Advanced S...
Google Suggestions
git
github
gitlab
gitlab uwaterloo
git rebase
Bookmarks and History
Issues · JuliaLang/julia
github.com/JuliaLang/julia/i...
JuliaLang/julia: The Julia Language: A fresh approach to...
github.com/JuliaLang/julia
Options
github.com/eschnett/Echol...
JuliaCollections/DataStructures.jl: Julia implementation...
github.com/JuliaCollections...
eschnett/Echology
github.com/eschnett/Echol...
New Issue · JuliaLang/julia
github.com/JuliaLang/julia/i...
Include rsqrt function for Vec{4,Float32} · Issue #57 · es...
github.com/eschnett/SIMD.j...


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:13
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
home/eschnetter/
Untitled3
Welcome to Perimeter's HPC system "Sym...
Symmetry Usage Stats: 2019-09-24 13:12
Untitled
Symmetry Documentation
Documentation for Perimeter Institute's Symmetry high-performance computing system
View on GitHub
Welcome to Perimeter's HPC system "Symmetry"
Symmetries are important in physics. Noether's theorem states that every local symmetry of a physical system generates a conservation law. In honour of this principle, Perimeter's HPC system is called Symmetry.
Symmetry is intended to serve the needs of Perimeter researchers, filling a gap between personal devices such as laptops and desktops, and large national sytems offered e.g. by Compute Canada. As such, each node of Symmetry is significantly more powerful than a laptop, but cannot compete with a national system such as Graham or Niagara.
(This documentation is still under construction, and should be completed within the next days. Please report errors, omissions, and suggestions for this documentation to our help desk.)
Contact and help
As usual for all technical systems at Perimeter, the main channel to report issues and ask for assistance is our help desk.

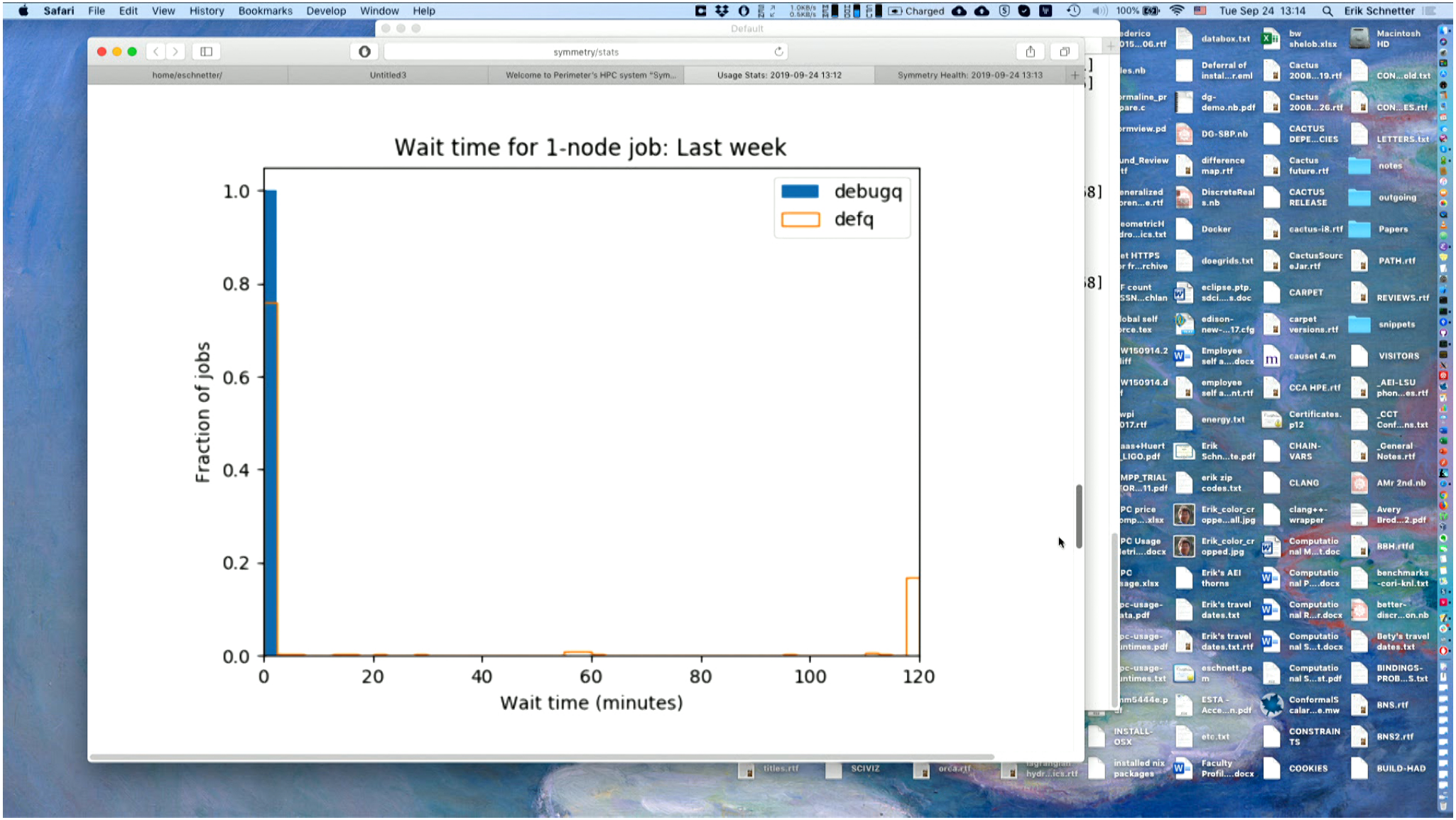
Symmetry Usage Stats: 2019-09-24 13:12

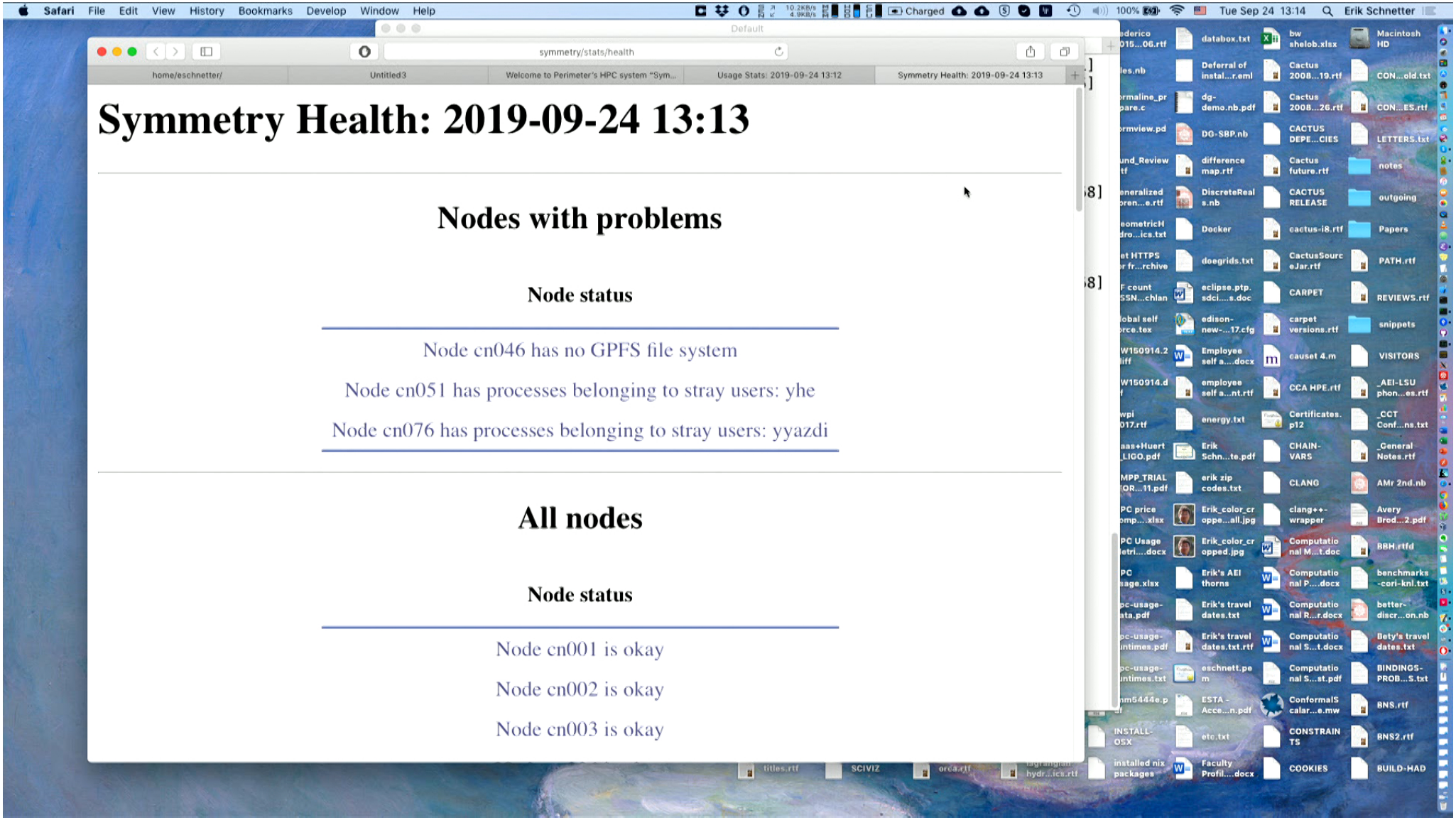
Current Node Status

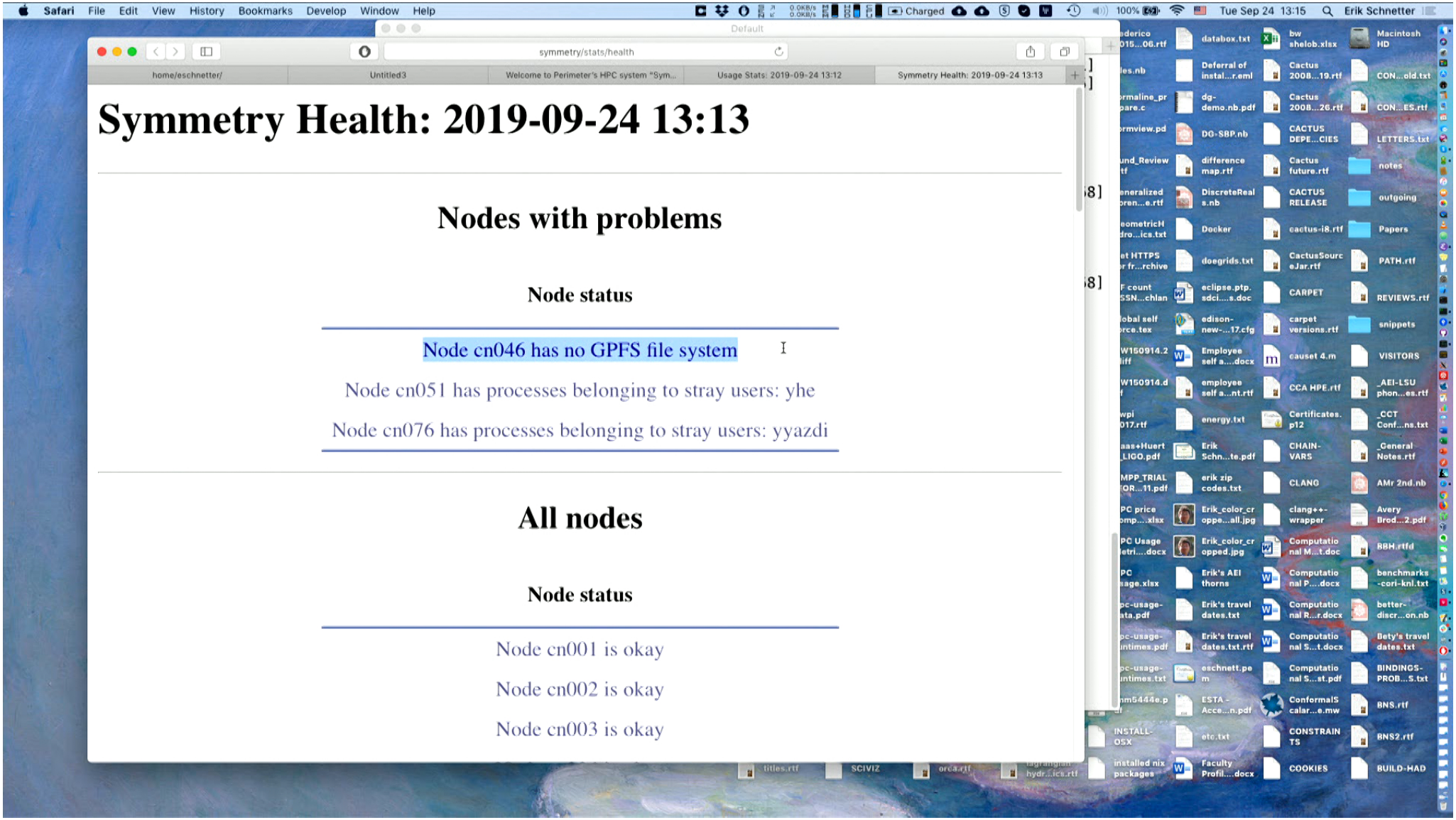




Queue	Node	State	Memory Used (%)	CPU Load (%)	User	Job
defq	cn046	drained	5	0		
defq	cn047	allocated	13	0		
defq	cn048	allocated	11	0		
defq	cn065	allocated	42	0	ugiri	44622
defq	cn067	allocated	10	100	weast	44187
defq	cn068	allocated	9	100	weast	44187
defq	cn001	allocated	18	100	zlyu	44635
defq	cn002	allocated	14	100	zlyu	44635
defq	cn003	allocated	13	101	zlyu	44635
defq	cn004	allocated	15	100	zlyu	44635
defq	cn005	allocated	24	100	zlyu	44635
defq	cn006	allocated	17	100	zlyu	44635
defq	cn007	allocated	16	100	zlyu	44635
defq	cn008	allocated	14	101	zlyu	44635


Wait time for 1-node job: Last week
debugq
defq
Fraction of jobs
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
120
Wait time (minutes)


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:14
Erik Schnetter
symmetry/stats/health
home/eschnetter/
Untitled3
Welcome to Perimeter's HPC system "Sym...
Usage Stats: 2019-09-24 13:12
Symmetry Health: 2019-09-24 13:13
Symmetry Health: 2019-09-24 13:13
Nodes with problems
Node status
Node cn046 has no GPFS file system
Node cn051 has processes belonging to stray users: yhe
Node cn076 has processes belonging to stray users: yyazdi
All nodes
Node status
Node cn001 is okay
Node cn002 is okay
Node cn003 is okay


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:15
Erik Schnetter
symmetry/stats/health
home/eschnetter/
Untitled3
Welcome to Perimeter's HPC system "Sym...
Usage Stats: 2019-09-24 13:12
Symmetry Health: 2019-09-24 13:13
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Node status
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All nodes
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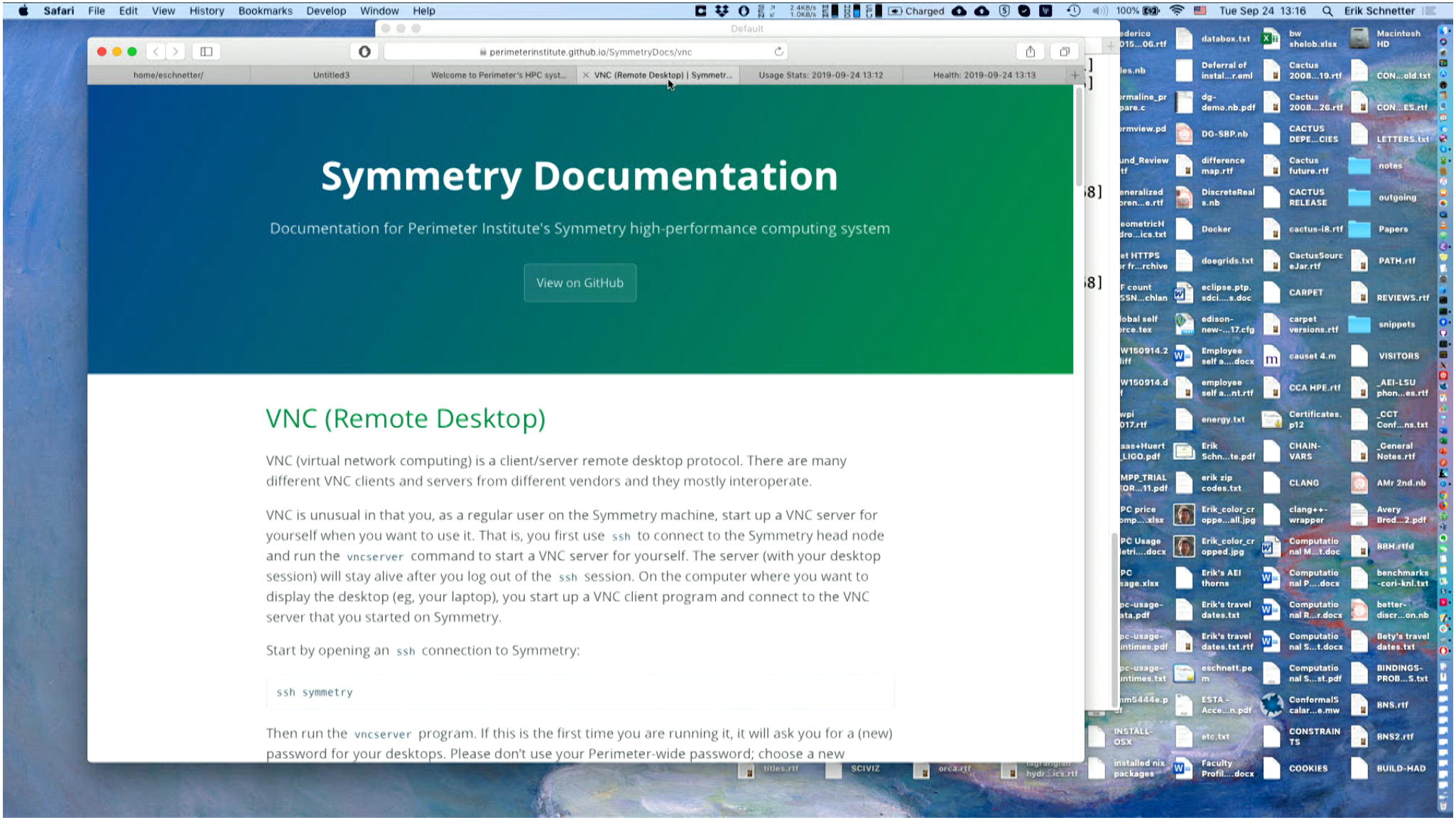
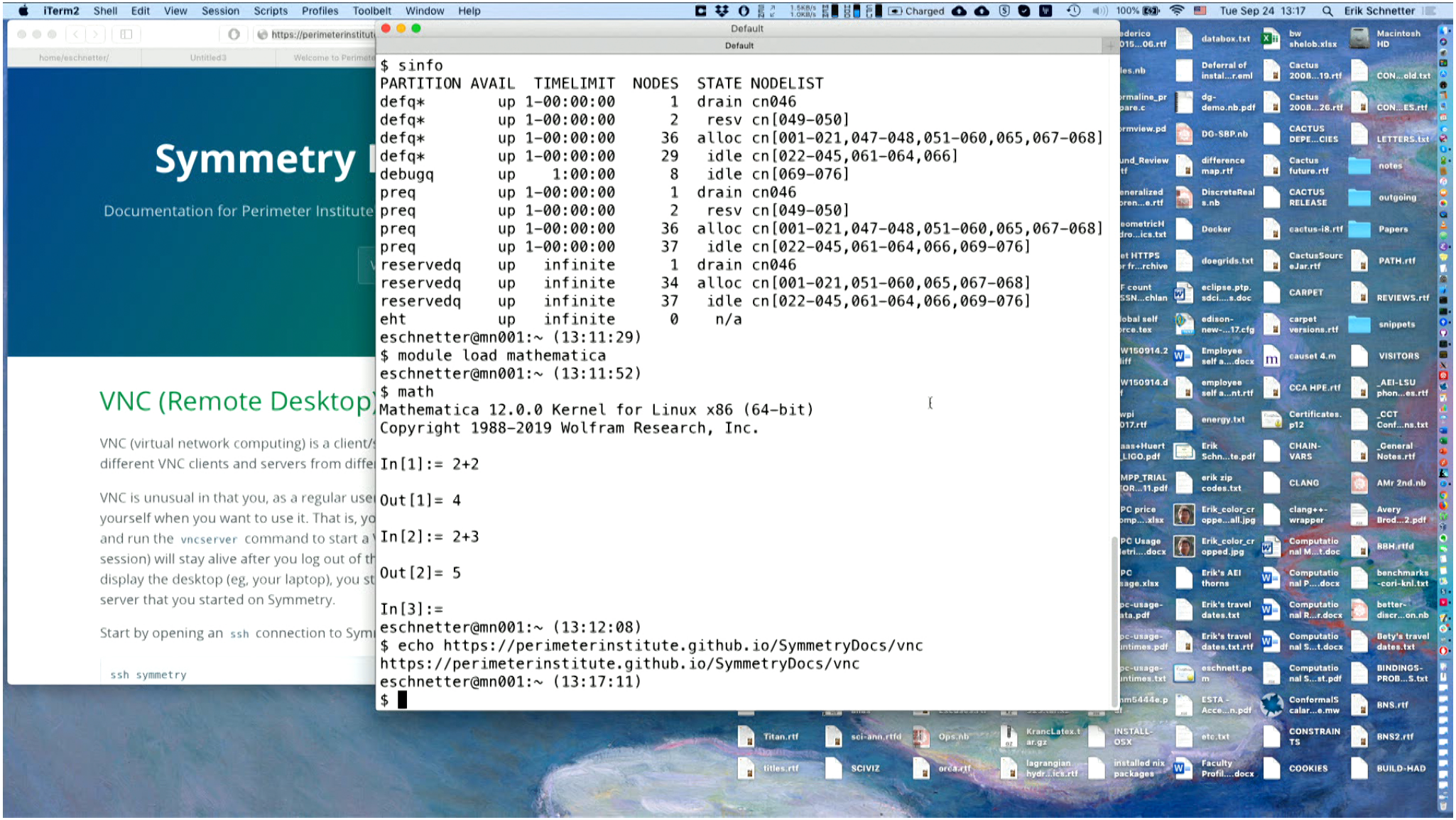
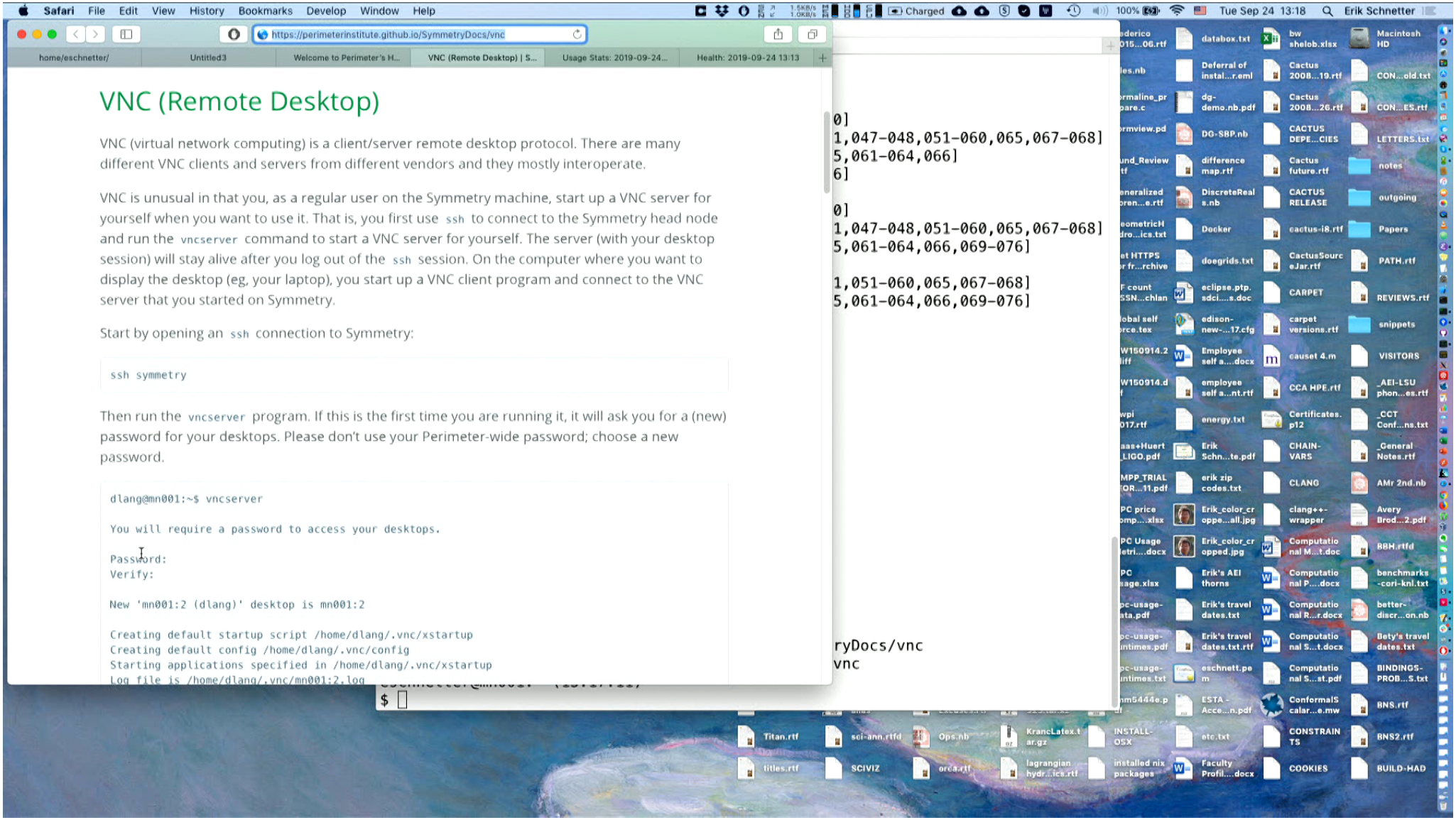
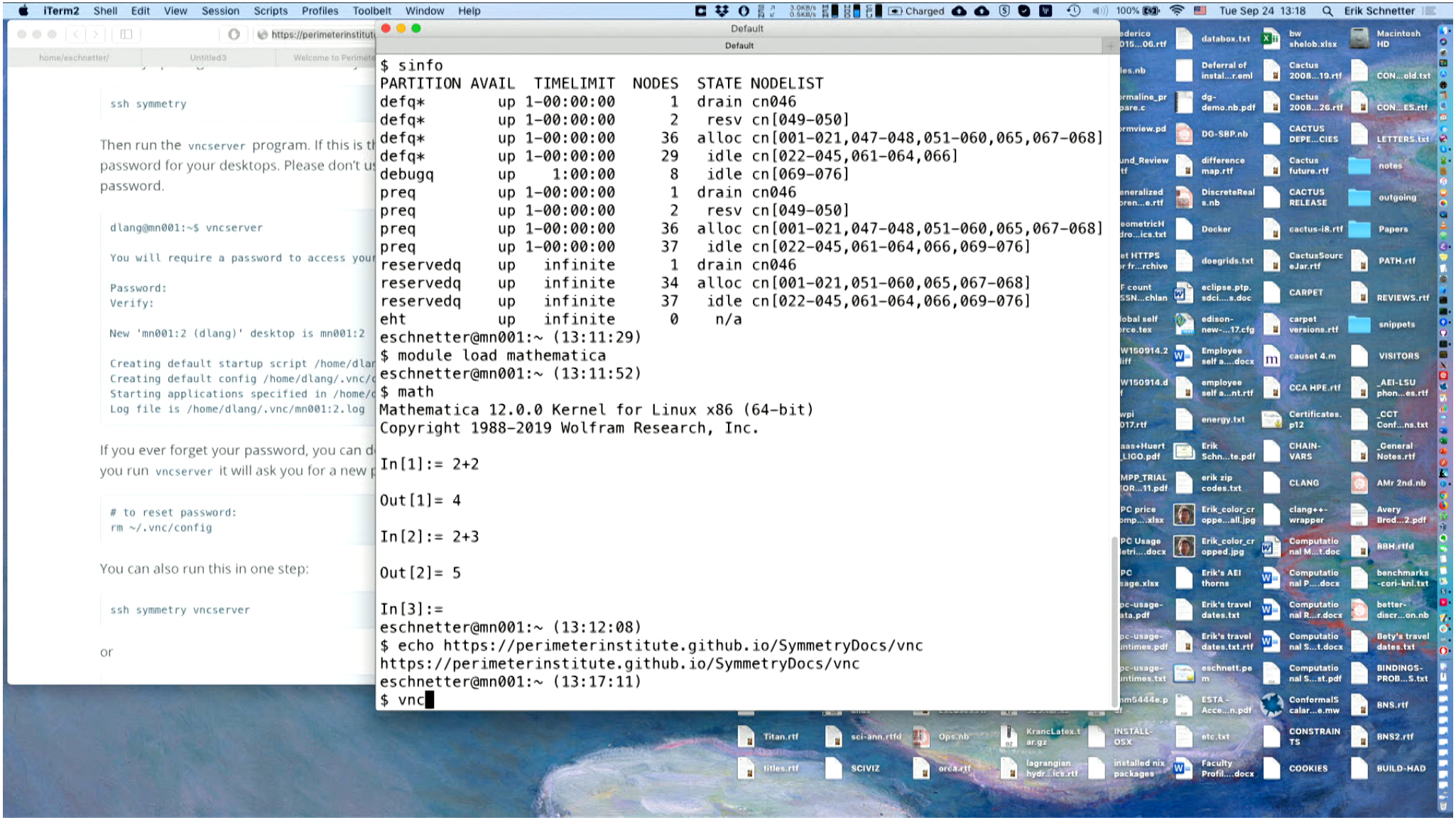

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:16
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/vnc
home/eschnetter/
Untitled3
Welcome to Perimeter's HPC syst...
VNC (Remote Desktop) | Symmetr...
Usage Stats: 2019-09-24 13:12
Health: 2019-09-24 13:13
Symmetry Documentation
Documentation for Perimeter Institute's Symmetry high-performance computing system
View on GitHub
VNC (Remote Desktop)
VNC (virtual network computing) is a client/server remote desktop protocol. There are many different VNC clients and servers from different vendors and they mostly interoperate.
VNC is unusual in that you, as a regular user on the Symmetry machine, start up a VNC server for yourself when you want to use it. That is, you first use ssh to connect to the Symmetry head node and run the vncserver command to start a VNC server for yourself. The server (with your desktop session) will stay alive after you log out of the ssh session. On the computer where you want to display the desktop (eg, your laptop), you start up a VNC client program and connect to the VNC server that you started on Symmetry.
Start by opening an ssh connection to Symmetry:
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you for a (new) password for your desktops. Please don't use your Perimeter-wide password; choose a new


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:17
Erik Schnetter
Default
$ sinfo
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
defq* up 1-00:00:00 1 drain cn046
defq* up 1-00:00:00 2 resv cn[049-050]
defq* up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
defq* up 1-00:00:00 29 idle cn[022-045,061-064,066]
debugq up 1:00:00 8 idle cn[069-076]
preq up 1-00:00:00 1 drain cn046
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 37 idle cn[022-045,061-064,066,069-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
eht up infinite 0 n/a
eschnetter@mn001:~ (13:11:29)
$ module load mathematica
eschnetter@mn001:~ (13:11:52)
$ math
Mathematica 12.0.0 Kernel for Linux x86 (64-bit)
Copyright 1988-2019 Wolfram Research, Inc.
In[1]:= 2+2
Out[1]= 4
In[2]:= 2+3
Out[2]= 5
In[3]:=
eschnetter@mn001:~ (13:12:08)
$ echo https://perimeterinstitute.github.io/SymmetryDocs/vnc
https://perimeterinstitute.github.io/SymmetryDocs/vnc
eschnetter@mn001:~ (13:17:11)
$
Symmetry
Documentation for Perimeter Institute
VNC (Remote Desktop)
VNC (virtual network computing) is a client/
different VNC clients and servers from diffe
VNC is unusual in that you, as a regular use
yourself when you want to use it. That is, yo
and run the vncserver command to start a
session) will stay alive after you log out of th
display the desktop (eg, your laptop), you st
server that you started on Symmetry.
Start by opening an ssh connection to Sym
ssh symmetry


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:18
Erik Schnetter
https://perimeterinstitute.github.io/SymmetryDocs/vnc
home/eschnetter/
Untitled3
Welcome to Perimeter's H...
VNC (Remote Desktop) | S...
Usage Stats: 2019-09-24...
Health: 2019-09-24 13:13
VNC (Remote Desktop)
VNC (virtual network computing) is a client/server remote desktop protocol. There are many different VNC clients and servers from different vendors and they mostly interoperate.
VNC is unusual in that you, as a regular user on the Symmetry machine, start up a VNC server for yourself when you want to use it. That is, you first use ssh to connect to the Symmetry head node and run the vncserver command to start a VNC server for yourself. The server (with your desktop session) will stay alive after you log out of the ssh session. On the computer where you want to display the desktop (eg, your laptop), you start up a VNC client program and connect to the VNC server that you started on Symmetry.
Start by opening an ssh connection to Symmetry:
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you for a (new) password for your desktops. Please don't use your Perimeter-wide password; choose a new password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
0]
1,047-048,051-060,065,067-068]
5,061-064,066]
6]
0]
1,047-048,051-060,065,067-068]
5,061-064,066,069-076]
1,051-060,065,067-068]
5,061-064,066,069-076]
ryDocs/vnc
vnc
$
databox.txt
bw shelob.xlsx
Macintosh HD
Deferral of instal...r.eml
Cactus 2008...19.rtf
CON...old.txt
dg-demo.nb.pdf
Cactus 2008...26.rtf
CON...ES.rtf
DG-S8P.nb
CACTUS DEPE...CIES
LETTERS.txt
difference map.rtf
Cactus future.rtf
notes
DiscreteReals.nb
CACTUS RELEASE
outgoing
Docker
cactus-i8.rtf
Papers
doegrids.txt
CactusSourceJar.rtf
PATH.rtf
eclipse.ptp.sdci....s.doc
CARPET
REVIEWS.rtf
edison-new-...17.cfg
carpet versions.rtf
snippets
Employee self a....docx
causet 4.m
VISITORS
employee self a...nt.rtf
CCA HPE.rtf
_AEI-LSU phon...es.rtf
energy.txt
Certificates.p12
_CCT Conf...ns.txt
Erik Schn...te.pdf
CHAIN-VARS
_General Notes.rtf
erik zip codes.txt
CLANG
AMr 2nd.nb
Erik_color_croppe...all.jpg
clang++-wrapper
Avery Brod...2.pdf
Erik_color_cropped.jpg
Computational M...t.doc
88H.rtfd
Erik's AEI thorns
Computational P....docx
benchmarks-cori-knl.txt
Erik's travel dates.txt
Computational R...r.docx
better-discr...on.nb
Erik's travel dates.txt.rtf
Computational S...t.docx
Bety's travel dates.txt
eschnett.pem
Computational S....st.pdf
BINDINGS-PROB...S.txt
ESTA - Acce....n.pdf
ConformalS calar...e.mw
BNS.rtf
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:18
Erik Schnetter
Default
Default
$ sinfo
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
defq* up 1-00:00:00 1 drain cn046
defq* up 1-00:00:00 2 resv cn[049-050]
defq* up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
defq* up 1-00:00:00 29 idle cn[022-045,061-064,066]
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preq up 1-00:00:00 1 drain cn046
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
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reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
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$ module load mathematica
eschnetter@mn001:~ (13:11:52)
$ math
Mathematica 12.0.0 Kernel for Linux x86 (64-bit)
Copyright 1988-2019 Wolfram Research, Inc.
In[1]:= 2+2
Out[1]= 4
In[2]:= 2+3
Out[2]= 5
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eschnetter@mn001:~ (13:12:08)
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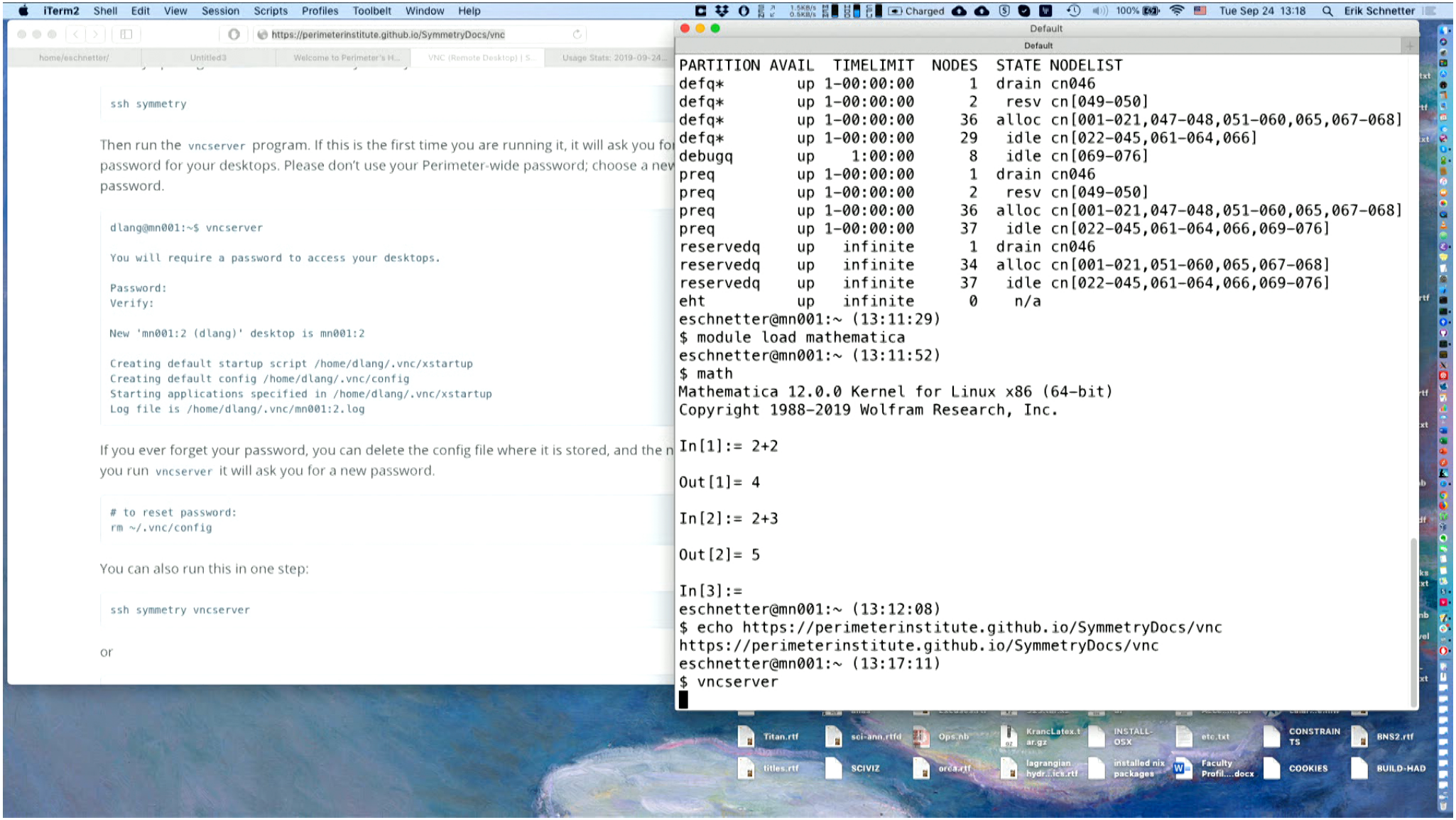
https://perimeterinstitute.github.io/SymmetryDocs/vnc
eschnetter@mn001:~ (13:17:11)
$ vnc
ssh symmetry
Then run the vncserver program. If this is t
password for your desktops. Please don't u
password.
dlang@mn001:~$ vncserver
You will require a password to access you
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dla
Creating default config /home/dlang/.vnc/
Starting applications specified in /home/
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can d
you run vncserver it will ask you for a new
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:18
Erik Schnetter
https://perimeterinstitute.github.io/SymmetryDocs/vnc
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you for
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password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the n
you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
Default
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
defq* up 1-00:00:00 1 drain cn046
defq* up 1-00:00:00 2 resv cn[049-050]
defq* up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
defq* up 1-00:00:00 29 idle cn[022-045,061-064,066]
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preq up 1-00:00:00 1 drain cn046
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 37 idle cn[022-045,061-064,066,069-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
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$ module load mathematica
eschnetter@mn001:~ (13:11:52)
$ math
Mathematica 12.0.0 Kernel for Linux x86 (64-bit)
Copyright 1988-2019 Wolfram Research, Inc.
In[1]:= 2+2
Out[1]= 4
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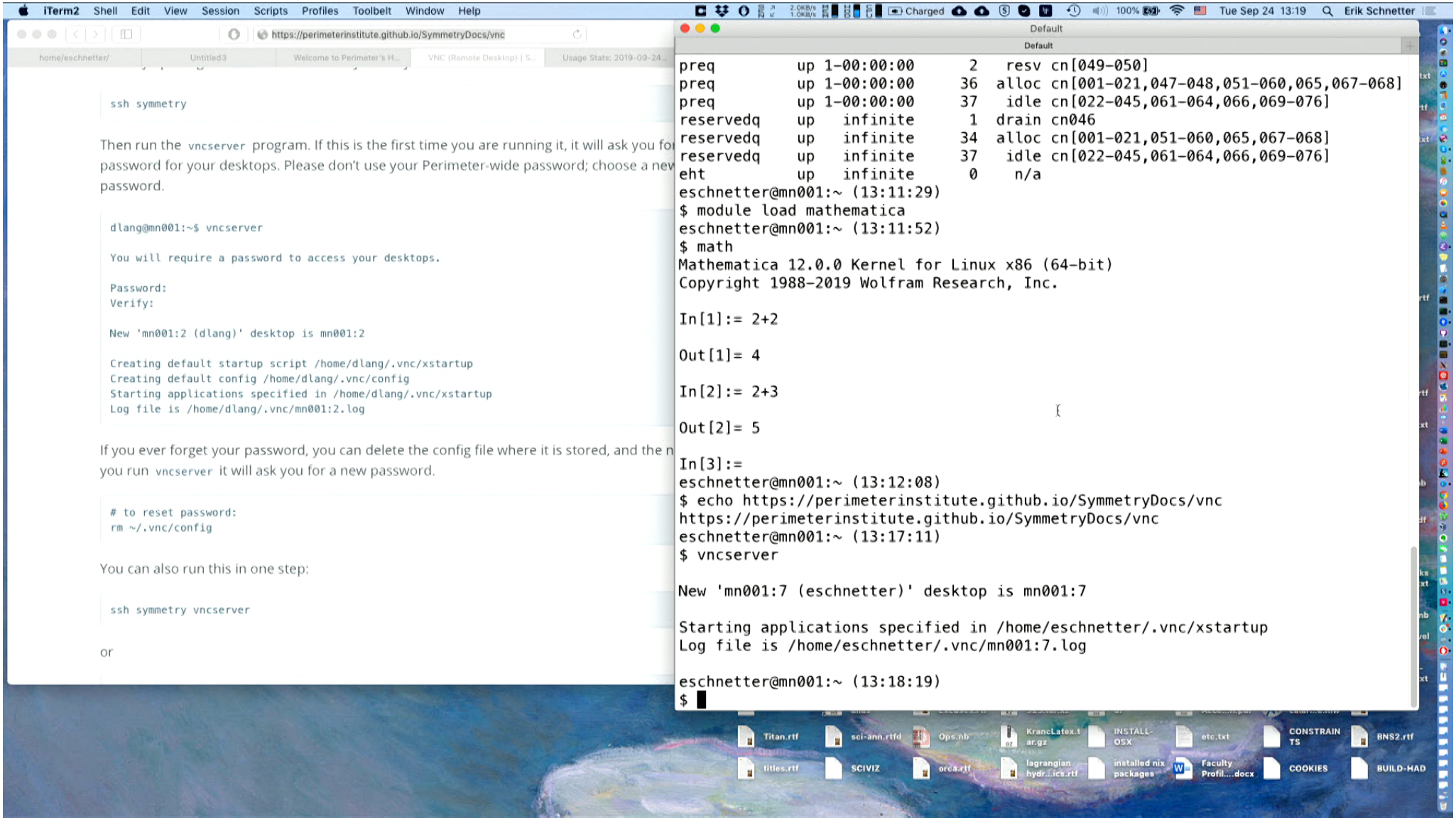
Out[2]= 5
In[3]:=
eschnetter@mn001:~ (13:12:08)
$ echo https://perimeterinstitute.github.io/SymmetryDocs/vnc
https://perimeterinstitute.github.io/SymmetryDocs/vnc
eschnetter@mn001:~ (13:17:11)
$ vncserver
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:19
Erik Schnetter
https://perimeterinstitute.github.io/SymmetryDocs/vnc
ssh symmetry
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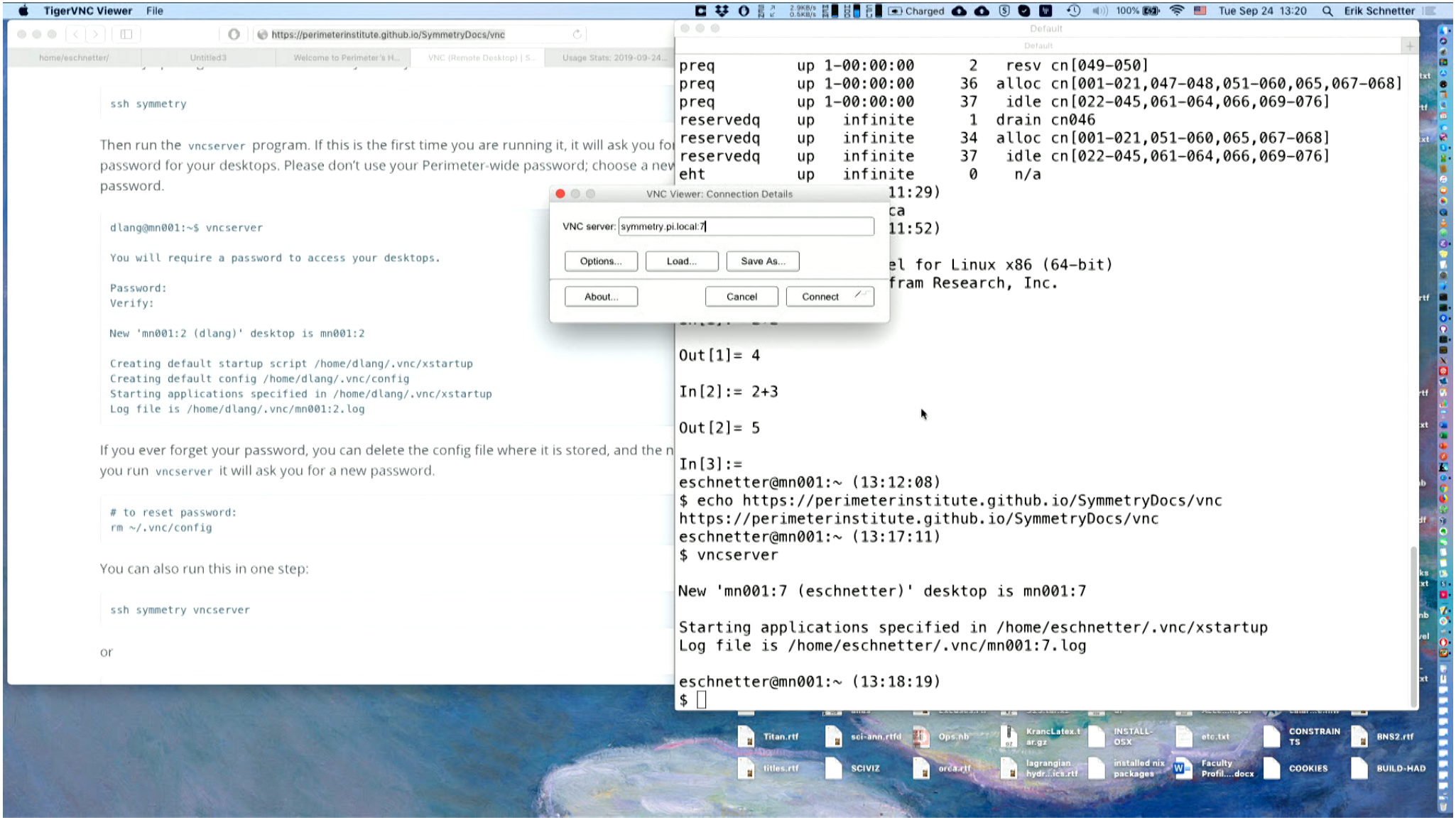
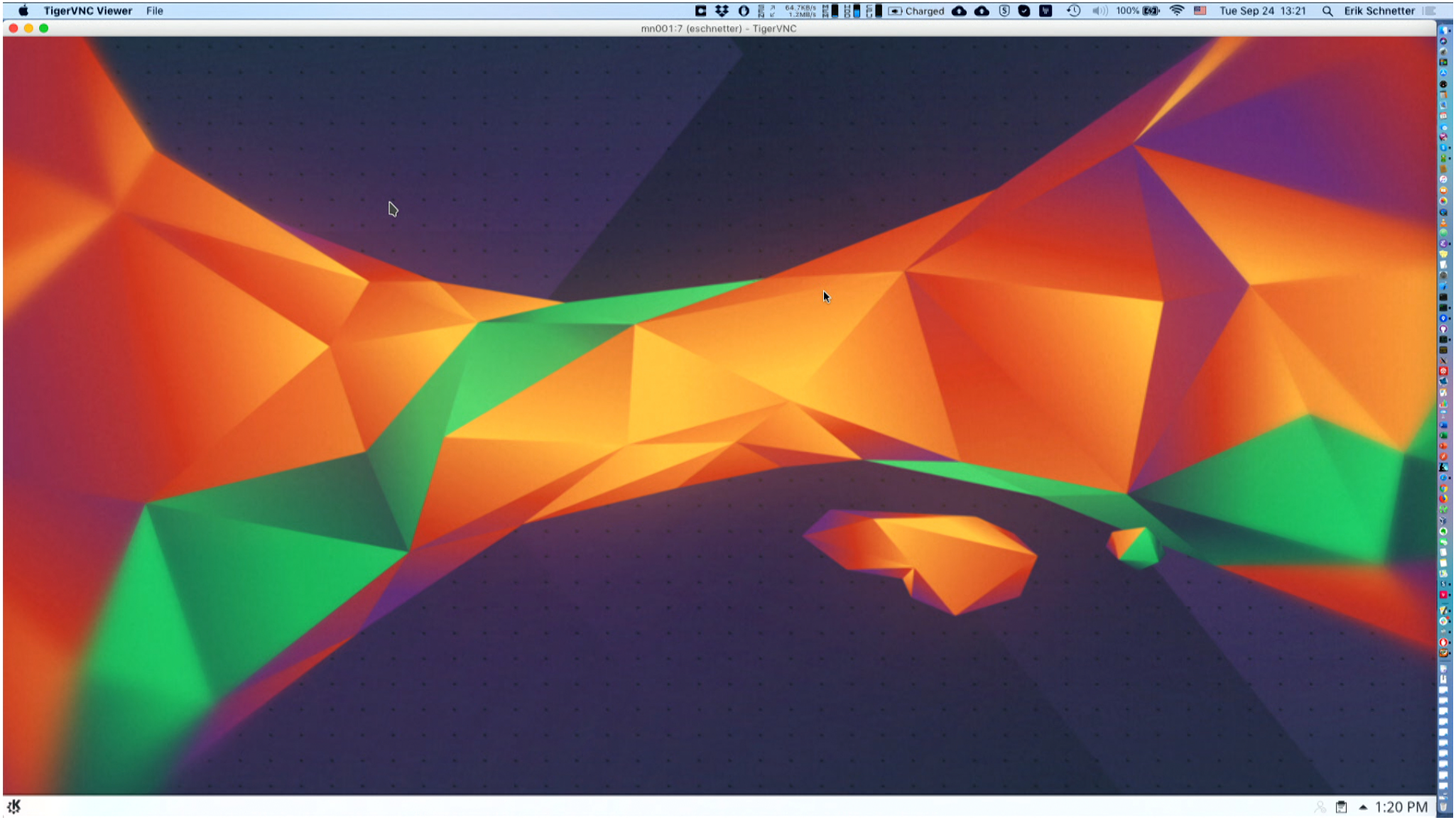
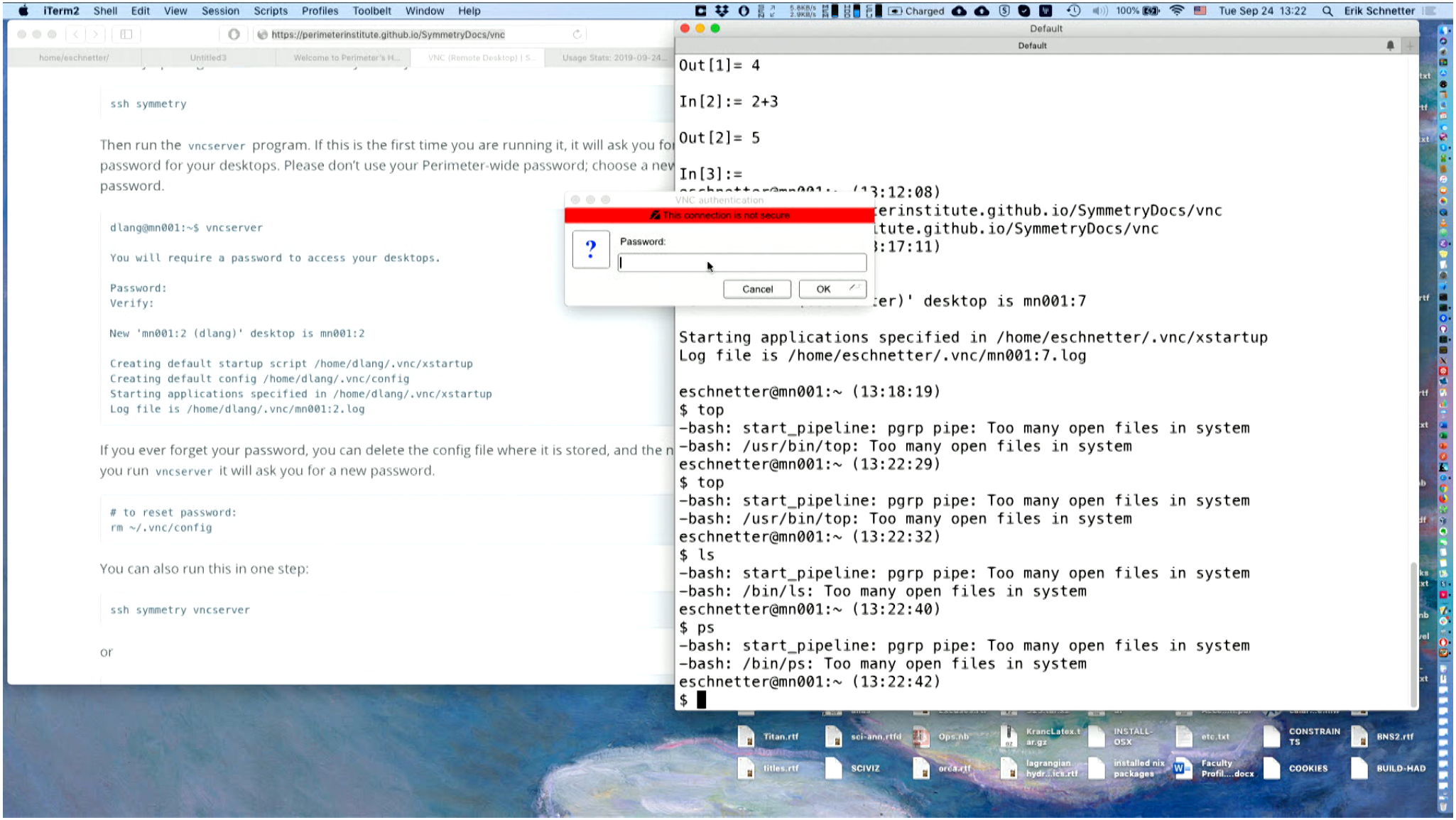
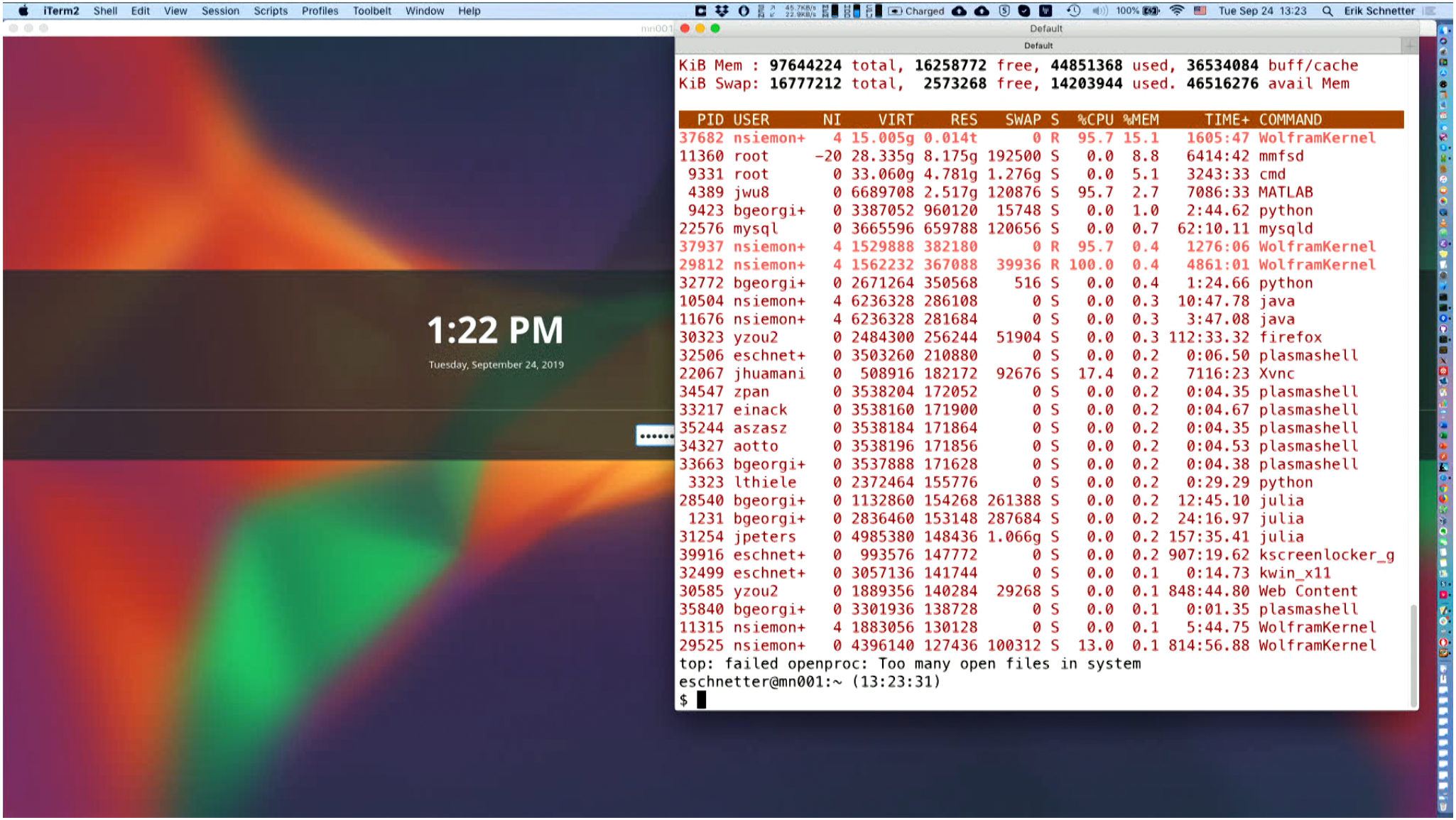
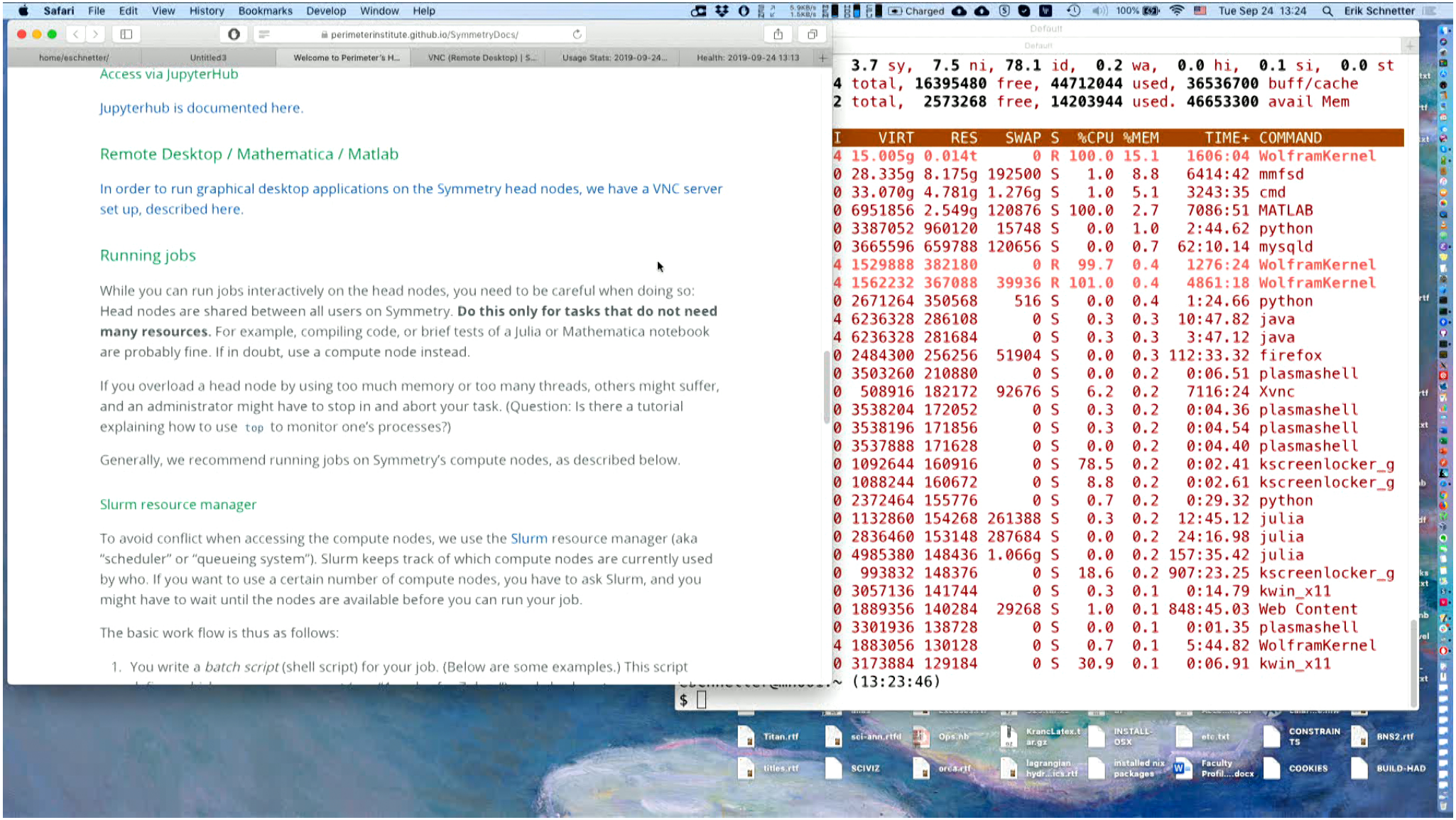
password for your desktops. Please don't use your Perimeter-wide password; choose a new
password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the n
you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
Default
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 37 idle cn[022-045,061-064,066,069-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
eht up infinite 0 n/a
eschnetter@mn001:~ (13:11:29)
$ module load mathematica
eschnetter@mn001:~ (13:11:52)
$ math
Mathematica 12.0.0 Kernel for Linux x86 (64-bit)
Copyright 1988-2019 Wolfram Research, Inc.
In[1]:= 2+2
Out[1]= 4
In[2]:= 2+3
Out[2]= 5
In[3]:=
eschnetter@mn001:~ (13:12:08)
$ echo https://perimeterinstitute.github.io/SymmetryDocs/vnc
https://perimeterinstitute.github.io/SymmetryDocs/vnc
eschnetter@mn001:~ (13:17:11)
$ vncserver
New 'mn001:7 (eschnetter)' desktop is mn001:7
Starting applications specified in /home/eschnetter/.vnc/xstartup
Log file is /home/eschnetter/.vnc/mn001:7.log
eschnetter@mn001:~ (13:18:19)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD

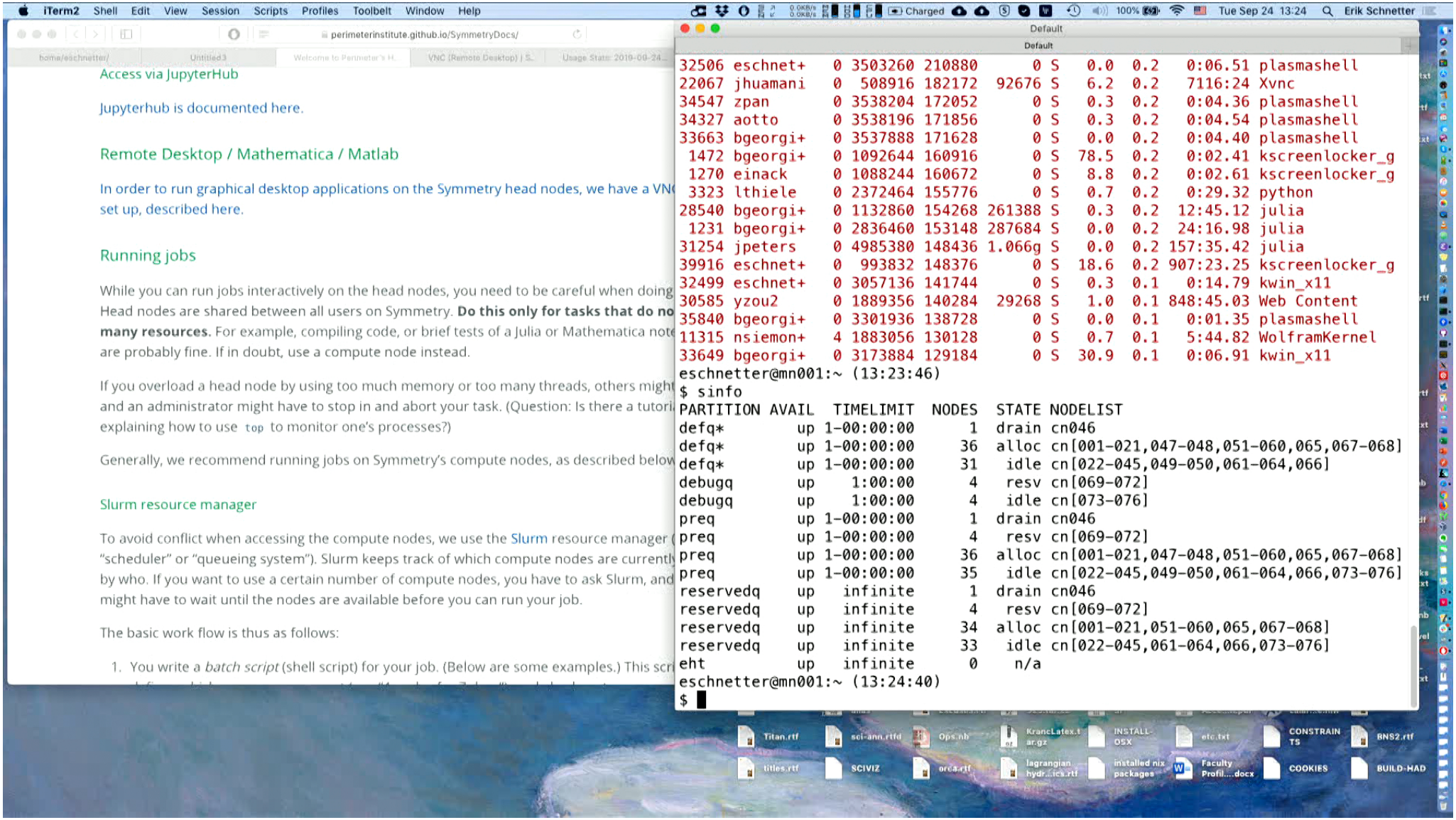

TigerVNC Viewer File
Tue Sep 24 13:20
Erik Schnetter
https://perimeterinstitute.github.io/SymmetryDocs/vnc
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you fo
password for your desktops. Please don't use your Perimeter-wide password; choose a new
password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the n
you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
VNC Viewer: Connection Details
VNC server: symmetry.pi.local:7
Options...
Load...
Save As...
About...
Cancel
Connect
preq up 1-00:00:00 2 resv cn[049-050]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 37 idle cn[022-045,061-064,066,069-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 37 idle cn[022-045,061-064,066,069-076]
eht up infinite 0 n/a
Out[1]= 4
In[2]:= 2+3
Out[2]= 5
In[3]:=
eschnetter@mn001:~ (13:12:08)
$ echo https://perimeterinstitute.github.io/SymmetryDocs/vnc
https://perimeterinstitute.github.io/SymmetryDocs/vnc
eschnetter@mn001:~ (13:17:11)
$ vncserver
New 'mn001:7 (eschnetter)' desktop is mn001:7
Starting applications specified in /home/eschnetter/.vnc/xstartup
Log file is /home/eschnetter/.vnc/mn001:7.log
eschnetter@mn001:~ (13:18:19)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


TigerVNC Viewer File
Charged
100%
Tue Sep 24 13:21
Erik Schnetter
mn001:7 (eschnetter) - TigerVNC
1:20 PM


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:22
Erik Schnetter
https://perimeterinstitute.github.io/SymmetryDocs/vnc
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you fo
password for your desktops. Please don't use your Perimeter-wide password; choose a new
password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the n
you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
VNC authentication
This connection is not secure
Password:
Cancel
OK
Default
Out[1]= 4
In[2]:= 2+3
Out[2]= 5
In[3]:=
Starting applications specified in /home/eschnetter/.vnc/xstartup
Log file is /home/eschnetter/.vnc/mn001:7.log
eschnetter@mn001:~ (13:18:19)
$ top
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /usr/bin/top: Too many open files in system
eschnetter@mn001:~ (13:22:29)
$ top
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /usr/bin/top: Too many open files in system
eschnetter@mn001:~ (13:22:32)
$ ls
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /bin/ls: Too many open files in system
eschnetter@mn001:~ (13:22:40)
$ ps
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /bin/ps: Too many open files in system
eschnetter@mn001:~ (13:22:42)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged 100% Tue Sep 24 13:23 Erik Schnetter
mn001
Default
Default
1:22 PM
Tuesday, September 24, 2019
KiB Mem : 97644224 total, 16258772 free, 44851368 used, 36534084 buff/cache
KiB Swap: 16777212 total, 2573268 free, 14203944 used. 46516276 avail Mem
PID USER NI VIRT RES SWAP S %CPU %MEM TIME+ COMMAND
37682 nsiemon+ 4 15.005g 0.014t 0 R 95.7 15.1 1605:47 WolframKernel
11360 root -20 28.335g 8.175g 192500 S 0.0 8.8 6414:42 mmfsd
9331 root 0 33.060g 4.781g 1.276g S 0.0 5.1 3243:33 cmd
4389 jwu8 0 6689708 2.517g 120876 S 95.7 2.7 7086:33 MATLAB
9423 bgeorgi+ 0 3387052 960120 15748 S 0.0 1.0 2:44.62 python
22576 mysql 0 3665596 659788 120656 S 0.0 0.7 62:10.11 mysqld
37937 nsiemon+ 4 1529888 382180 0 R 95.7 0.4 1276:06 WolframKernel
29812 nsiemon+ 4 1562232 367088 39936 R 100.0 0.4 4861:01 WolframKernel
32772 bgeorgi+ 0 2671264 350568 516 S 0.0 0.4 1:24.66 python
10504 nsiemon+ 4 6236328 286108 0 S 0.0 0.3 10:47.78 java
11676 nsiemon+ 4 6236328 281684 0 S 0.0 0.3 3:47.08 java
30323 yzou2 0 2484300 256244 51904 S 0.0 0.3 112:33.32 firefox
32506 eschnet+ 0 3503260 210880 0 S 0.0 0.2 0:06.50 plasmashell
22067 jhuamani 0 508916 182172 92676 S 17.4 0.2 7116:23 Xvnc
34547 zpan 0 3538204 172052 0 S 0.0 0.2 0:04.35 plasmashell
33217 einack 0 3538160 171900 0 S 0.0 0.2 0:04.67 plasmashell
35244 aszasz 0 3538184 171864 0 S 0.0 0.2 0:04.35 plasmashell
34327 aotto 0 3538196 171856 0 S 0.0 0.2 0:04.53 plasmashell
33663 bgeorgi+ 0 3537888 171628 0 S 0.0 0.2 0:04.38 plasmashell
3323 lthiele 0 2372464 155776 0 S 0.0 0.2 0:29.29 python
28540 bgeorgi+ 0 1132860 154268 261388 S 0.0 0.2 12:45.10 julia
1231 bgeorgi+ 0 2836460 153148 287684 S 0.0 0.2 24:16.97 julia
31254 jpeters 0 4985380 148436 1.066g S 0.0 0.2 157:35.41 julia
39916 eschnet+ 0 993576 147772 0 S 0.0 0.2 907:19.62 kscreenlocker_g
32499 eschnet+ 0 3057136 141744 0 S 0.0 0.1 0:14.73 kwin_x11
30585 yzou2 0 1889356 140284 29268 S 0.0 0.1 848:44.80 Web Content
35840 bgeorgi+ 0 3301936 138728 0 S 0.0 0.1 0:01.35 plasmashell
11315 nsiemon+ 4 1883056 130128 0 S 0.0 0.1 5:44.75 WolframKernel
29525 nsiemon+ 0 4396140 127436 100312 S 13.0 0.1 814:56.88 WolframKernel
top: failed openproc: Too many open files in system
eschnetter@mn001:~ (13:23:31)
$


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:24
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
Access via JupyterHub
Jupyterhub is documented here.
Remote Desktop / Mathematica / Matlab
In order to run graphical desktop applications on the Symmetry head nodes, we have a VNC server set up, described here.
Running jobs
While you can run jobs interactively on the head nodes, you need to be careful when doing so: Head nodes are shared between all users on Symmetry. Do this only for tasks that do not need many resources. For example, compiling code, or brief tests of a Julia or Mathematica notebook are probably fine. If in doubt, use a compute node instead.
If you overload a head node by using too much memory or too many threads, others might suffer, and an administrator might have to stop in and abort your task. (Question: Is there a tutorial explaining how to use top to monitor one's processes?)
Generally, we recommend running jobs on Symmetry's compute nodes, as described below.
Slurm resource manager
To avoid conflict when accessing the compute nodes, we use the Slurm resource manager (aka "scheduler" or "queueing system"). Slurm keeps track of which compute nodes are currently used by who. If you want to use a certain number of compute nodes, you have to ask Slurm, and you might have to wait until the nodes are available before you can run your job.
The basic work flow is thus as follows:
1. You write a batch script (shell script) for your job. (Below are some examples.) This script
3.7 sy, 7.5 ni, 78.1 id, 0.2 wa, 0.0 hi, 0.1 si, 0.0 st
4 total, 16395480 free, 44712044 used, 36536700 buff/cache
2 total, 2573268 free, 14203944 used. 46653300 avail Mem
I VIRT RES SWAP S %CPU %MEM TIME+ COMMAND
4 15.005g 0.014t 0 R 100.0 15.1 1606:04 WolframKernel
0 28.335g 8.175g 192500 S 1.0 8.8 6414:42 mmfsd
0 33.070g 4.781g 1.276g S 1.0 5.1 3243:35 cmd
0 6951856 2.549g 120876 S 100.0 2.7 7086:51 MATLAB
0 3387052 960120 15748 S 0.0 1.0 2:44.62 python
0 3665596 659788 120656 S 0.0 0.7 62:10.14 mysqld
4 1529888 382180 0 R 99.7 0.4 1276:24 WolframKernel
4 1562232 367088 39936 R 101.0 0.4 4861:18 WolframKernel
0 2671264 350568 516 S 0.0 0.4 1:24.66 python
4 6236328 286108 0 S 0.3 0.3 10:47.82 java
4 6236328 281684 0 S 0.3 0.3 3:47.12 java
0 2484300 256256 51904 S 0.0 0.3 112:33.32 firefox
0 3503260 210880 0 S 0.0 0.2 0:06.51 plasmashell
0 508916 182172 92676 S 6.2 0.2 7116:24 Xvnc
0 3538204 172052 0 S 0.3 0.2 0:04.36 plasmashell
0 3538196 171856 0 S 0.3 0.2 0:04.54 plasmashell
0 3537888 171628 0 S 0.0 0.2 0:04.40 plasmashell
0 1092644 160916 0 S 78.5 0.2 0:02.41 kscreenlocker_g
0 1088244 160672 0 S 8.8 0.2 0:02.61 kscreenlocker_g
0 2372464 155776 0 S 0.7 0.2 0:29.32 python
0 1132860 154268 261388 S 0.3 0.2 12:45.12 julia
0 2836460 153148 287684 S 0.0 0.2 24:16.98 julia
0 4985380 148436 1.066g S 0.0 0.2 157:35.42 julia
0 993832 148376 0 S 18.6 0.2 907:23.25 kscreenlocker_g
0 3057136 141744 0 S 0.3 0.1 0:14.79 kwin_x11
0 1889356 140284 29268 S 1.0 0.1 848:45.03 Web Content
0 3301936 138728 0 S 0.0 0.1 0:01.35 plasmashell
4 1883056 130128 0 S 0.7 0.1 5:44.82 WolframKernel
0 3173884 129184 0 S 30.9 0.1 0:06.91 kwin_x11
~ (13:23:46)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:24
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
Access via JupyterHub
Jupyterhub is documented here.
Remote Desktop / Mathematica / Matlab
In order to run graphical desktop applications on the Symmetry head nodes, we have a VN
set up, described here.
Running jobs
While you can run jobs interactively on the head nodes, you need to be careful when doing
Head nodes are shared between all users on Symmetry. Do this only for tasks that do no
many resources. For example, compiling code, or brief tests of a Julia or Mathematica not
are probably fine. If in doubt, use a compute node instead.
If you overload a head node by using too much memory or too many threads, others might
and an administrator might have to stop in and abort your task. (Question: Is there a tutori
explaining how to use top to monitor one's processes?)
Generally, we recommend running jobs on Symmetry's compute nodes, as described below
Slurm resource manager
To avoid conflict when accessing the compute nodes, we use the Slurm resource manager
"scheduler" or "queueing system"). Slurm keeps track of which compute nodes are currentl
by who. If you want to use a certain number of compute nodes, you have to ask Slurm, and
might have to wait until the nodes are available before you can run your job.
The basic work flow is thus as follows:
1. You write a batch script (shell script) for your job. (Below are some examples.) This scr
Default
Default
32506 eschnet+ 0 3503260 210880 0 S 0.0 0.2 0:06.51 plasmashell
22067 jhuamani 0 508916 182172 92676 S 6.2 0.2 7116:24 Xvnc
34547 zpan 0 3538204 172052 0 S 0.3 0.2 0:04.36 plasmashell
34327 aotto 0 3538196 171856 0 S 0.3 0.2 0:04.54 plasmashell
33663 bgeorgi+ 0 3537888 171628 0 S 0.0 0.2 0:04.40 plasmashell
1472 bgeorgi+ 0 1092644 160916 0 S 78.5 0.2 0:02.41 kscreenlocker_g
1270 einack 0 1088244 160672 0 S 8.8 0.2 0:02.61 kscreenlocker_g
3323 lthiele 0 2372464 155776 0 S 0.7 0.2 0:29.32 python
28540 bgeorgi+ 0 1132860 154268 261388 S 0.3 0.2 12:45.12 julia
1231 bgeorgi+ 0 2836460 153148 287684 S 0.0 0.2 24:16.98 julia
31254 jpeters 0 4985380 148436 1.066g S 0.0 0.2 157:35.42 julia
39916 eschnet+ 0 993832 148376 0 S 18.6 0.2 907:23.25 kscreenlocker_g
32499 eschnet+ 0 3057136 141744 0 S 0.3 0.1 0:14.79 kwin_x11
30585 yzou2 0 1889356 140284 29268 S 1.0 0.1 848:45.03 Web Content
35840 bgeorgi+ 0 3301936 138728 0 S 0.0 0.1 0:01.35 plasmashell
11315 nsiemon+ 4 1883056 130128 0 S 0.7 0.1 5:44.82 WolframKernel
33649 bgeorgi+ 0 3173884 129184 0 S 30.9 0.1 0:06.91 kwin_x11
eschnetter@mn001:~ (13:23:46)
$ sinfo
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
defq* up 1-00:00:00 1 drain cn046
defq* up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
defq* up 1-00:00:00 31 idle cn[022-045,049-050,061-064,066]
debugq up 1:00:00 4 resv cn[069-072]
debugq up 1:00:00 4 idle cn[073-076]
preq up 1-00:00:00 1 drain cn046
preq up 1-00:00:00 4 resv cn[069-072]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 35 idle cn[022-045,049-050,061-064,066,073-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 4 resv cn[069-072]
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 33 idle cn[022-045,061-064,066,073-076]
eht up infinite 0 n/a
eschnetter@mn001:~ (13:24:40)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
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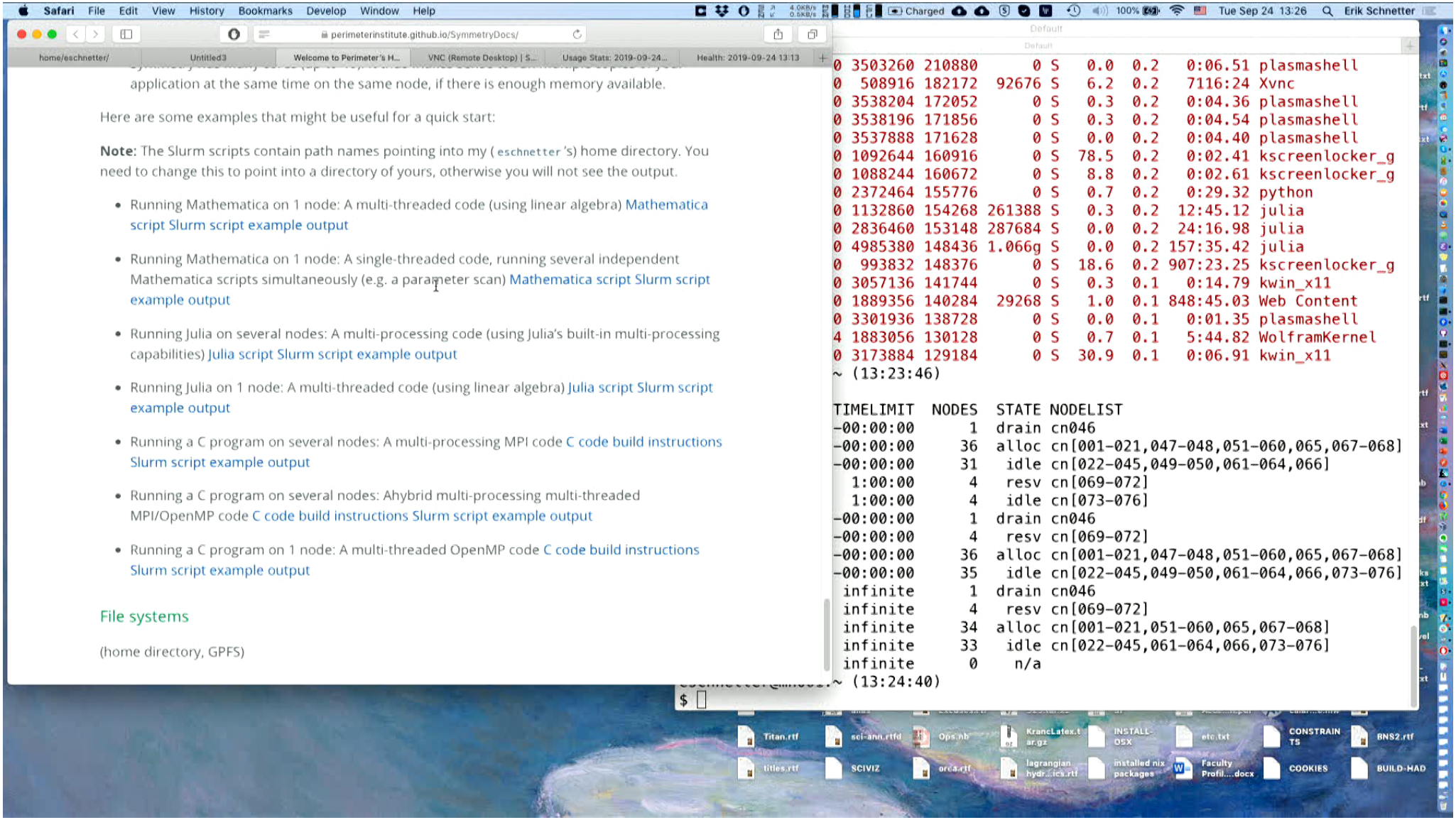
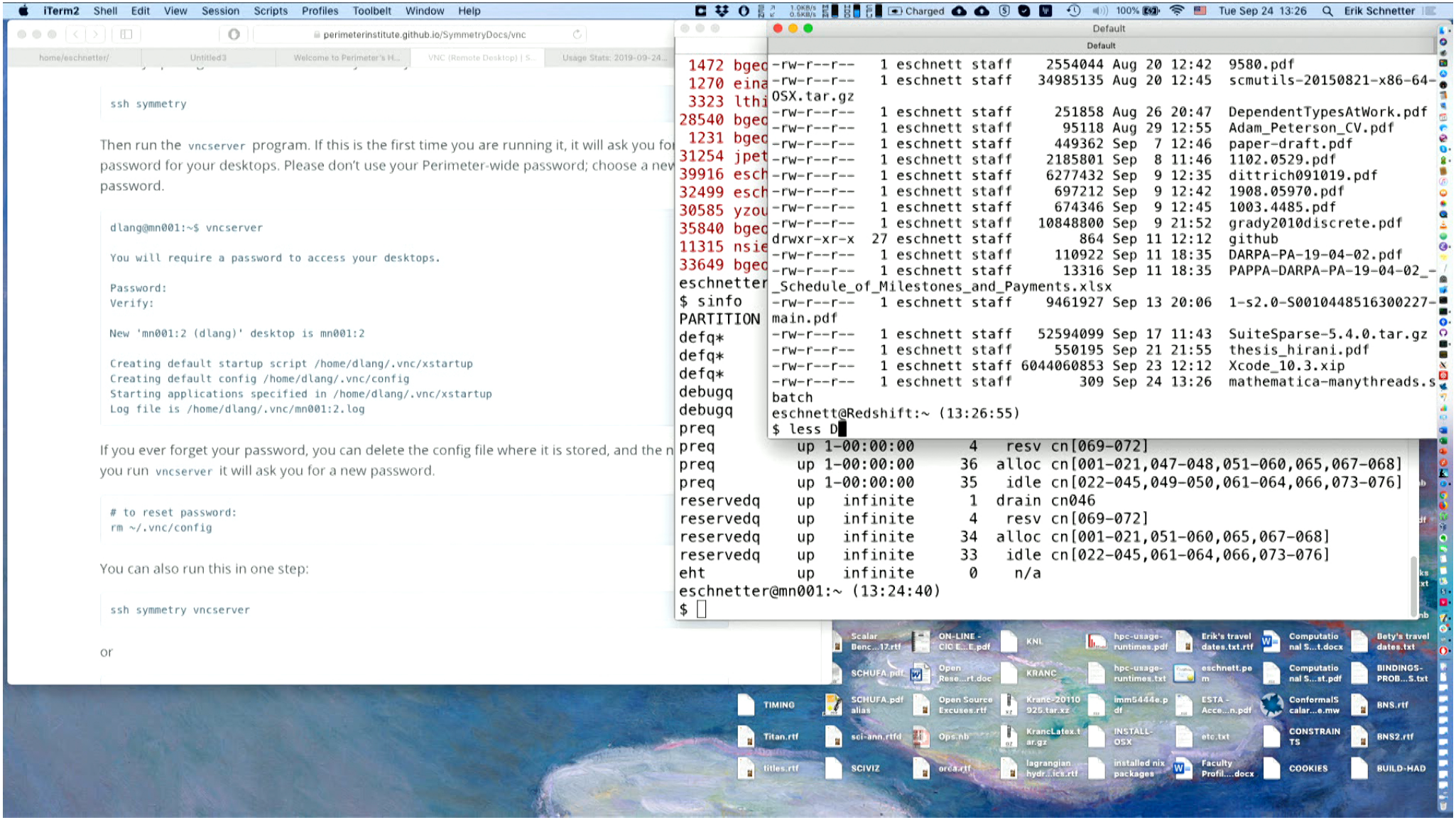
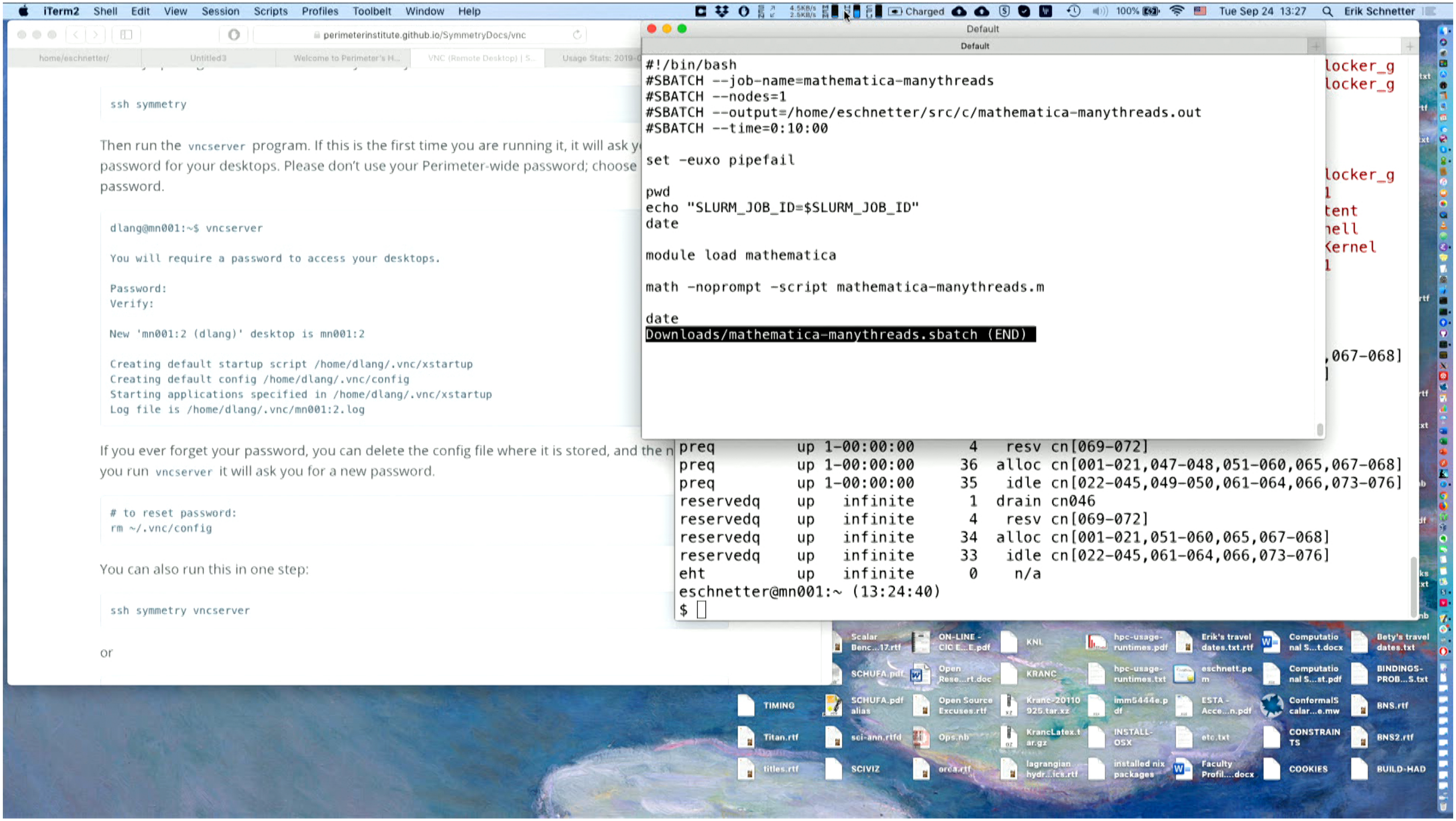
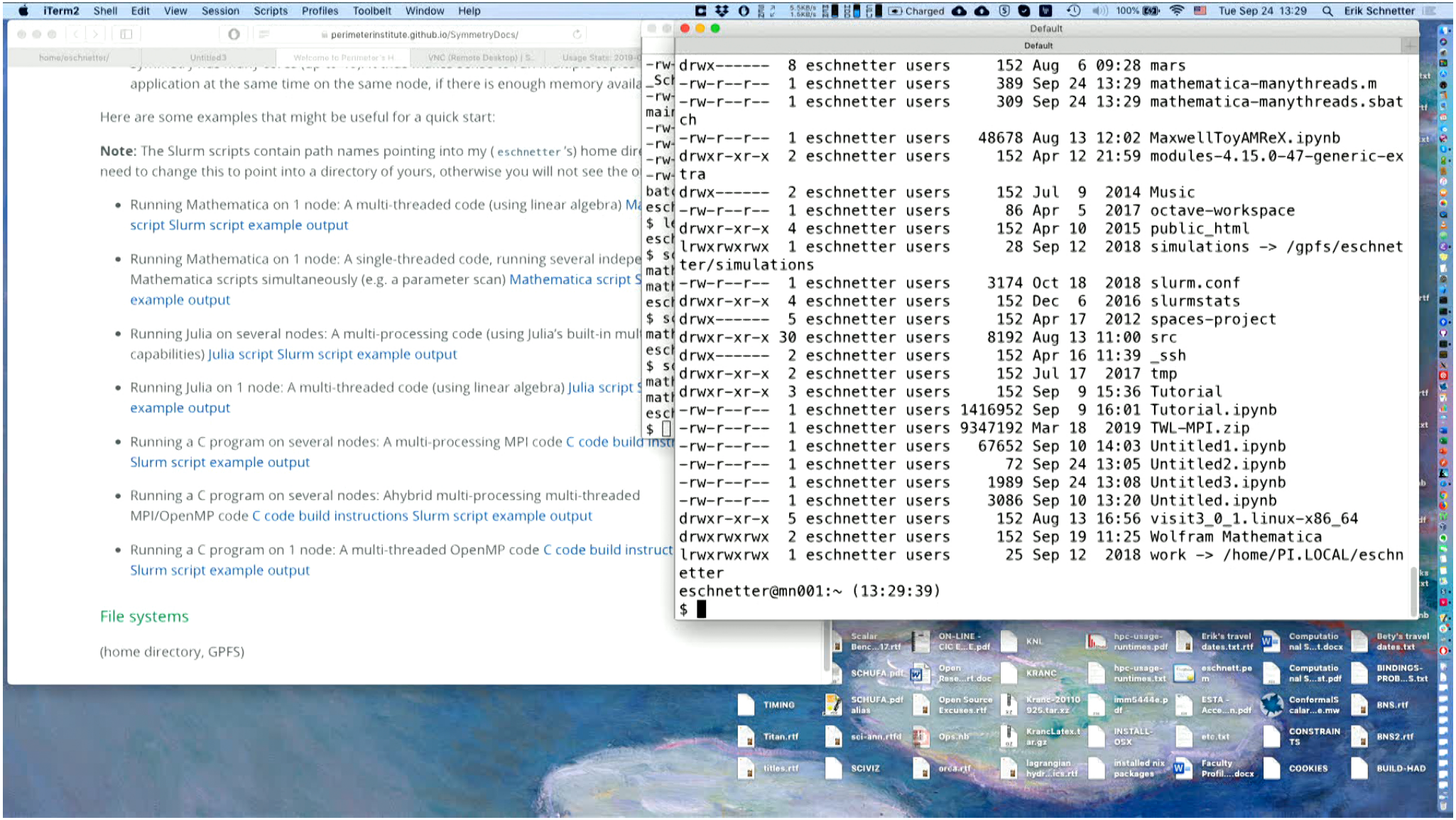
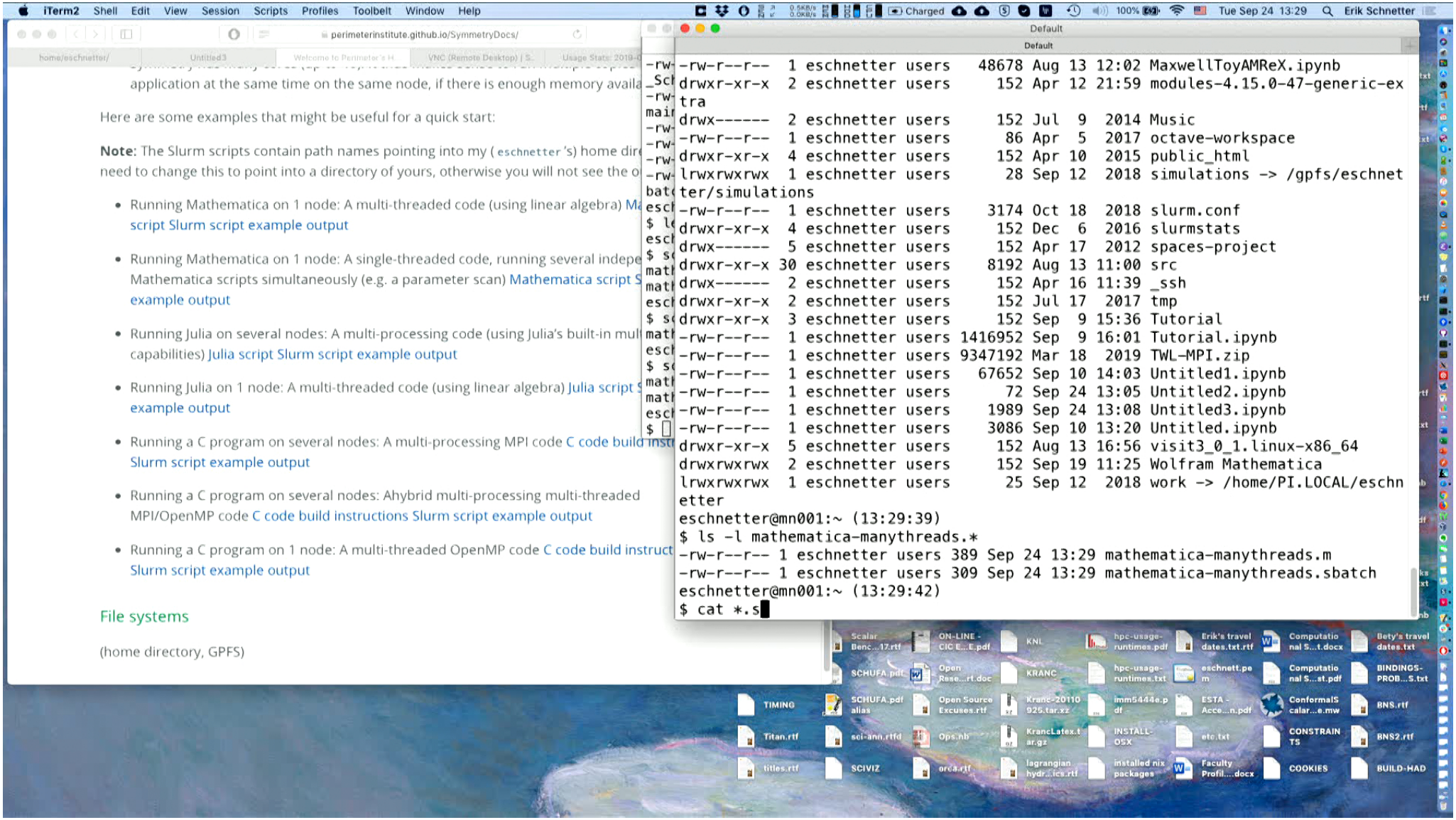

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:26
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory available.
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home directory. You need to change this to point into a directory of yours, otherwise you will not see the output.
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Mathematica script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several independent Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script Slurm script example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in multi-processing capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script Slurm script example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions Slurm script example output
File systems
(home directory, GPFS)
0 3503260 210880 0 S 0.0 0.2 0:06.51 plasmashell
0 508916 182172 92676 S 6.2 0.2 7116:24 Xvnc
0 3538204 172052 0 S 0.3 0.2 0:04.36 plasmashell
0 3538196 171856 0 S 0.3 0.2 0:04.54 plasmashell
0 3537888 171628 0 S 0.0 0.2 0:04.40 plasmashell
0 1092644 160916 0 S 78.5 0.2 0:02.41 kscreenlocker_g
0 1088244 160672 0 S 8.8 0.2 0:02.61 kscreenlocker_g
0 2372464 155776 0 S 0.7 0.2 0:29.32 python
0 1132860 154268 261388 S 0.3 0.2 12:45.12 julia
0 2836460 153148 287684 S 0.0 0.2 24:16.98 julia
0 4985380 148436 1.066g S 0.0 0.2 157:35.42 julia
0 993832 148376 0 S 18.6 0.2 907:23.25 kscreenlocker_g
0 3057136 141744 0 S 0.3 0.1 0:14.79 kwin_x11
0 1889356 140284 29268 S 1.0 0.1 848:45.03 Web Content
0 3301936 138728 0 S 0.0 0.1 0:01.35 plasmashell
4 1883056 130128 0 S 0.7 0.1 5:44.82 WolframKernel
0 3173884 129184 0 S 30.9 0.1 0:06.91 kwin_x11
~ (13:23:46)
TIMELIMIT NODES STATE NODELIST
-00:00:00 1 drain cn046
-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
-00:00:00 31 idle cn[022-045,049-050,061-064,066]
1:00:00 4 resv cn[069-072]
1:00:00 4 idle cn[073-076]
-00:00:00 1 drain cn046
-00:00:00 4 resv cn[069-072]
-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
-00:00:00 35 idle cn[022-045,049-050,061-064,066,073-076]
infinite 1 drain cn046
infinite 4 resv cn[069-072]
infinite 34 alloc cn[001-021,051-060,065,067-068]
infinite 33 idle cn[022-045,061-064,066,073-076]
infinite 0 n/a
~ (13:24:40)
$
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:26
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/vnc
ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask you for a password for your desktops. Please don't use your Perimeter-wide password; choose a new password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the next time you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
Default
-rw-r--r-- 1 eschnett staff 2554044 Aug 20 12:42 9580.pdf
-rw-r--r-- 1 eschnett staff 34985135 Aug 20 12:45 scmutils-20150821-x86-64-OSX.tar.gz
-rw-r--r-- 1 eschnett staff 251858 Aug 26 20:47 DependentTypesAtWork.pdf
-rw-r--r-- 1 eschnett staff 95118 Aug 29 12:55 Adam_Peterson_CV.pdf
-rw-r--r-- 1 eschnett staff 449362 Sep 7 12:46 paper-draft.pdf
-rw-r--r-- 1 eschnett staff 2185801 Sep 8 11:46 1102.0529.pdf
-rw-r--r-- 1 eschnett staff 6277432 Sep 9 12:35 dittrich091019.pdf
-rw-r--r-- 1 eschnett staff 697212 Sep 9 12:42 1908.05970.pdf
-rw-r--r-- 1 eschnett staff 674346 Sep 9 12:45 1003.4485.pdf
-rw-r--r-- 1 eschnett staff 10848800 Sep 9 21:52 grady2010discrete.pdf
drwxr-xr-x 27 eschnett staff 864 Sep 11 12:12 github
-rw-r--r-- 1 eschnett staff 110922 Sep 11 18:35 DARPA-PA-19-04-02.pdf
-rw-r--r-- 1 eschnett staff 13316 Sep 11 18:35 PAPPA-DARPA-PA-19-04-02_Schedule_of_Milestones_and_Payments.xlsx
-rw-r--r-- 1 eschnett staff 9461927 Sep 13 20:06 1-s2.0-S0010448516300227-main.pdf
-rw-r--r-- 1 eschnett staff 52594099 Sep 17 11:43 SuiteSparse-5.4.0.tar.gz
-rw-r--r-- 1 eschnett staff 550195 Sep 21 21:55 thesis_hirani.pdf
-rw-r--r-- 1 eschnett staff 6044060853 Sep 23 12:12 Xcode_10.3.xip
-rw-r--r-- 1 eschnett staff 309 Sep 24 13:26 mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:26:55)
$ less D
PARTITION
defq*
debugq
preq
reservedq
eht
up 1-00:00:00 4 resv cn[069-072]
up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
up 1-00:00:00 35 idle cn[022-045,049-050,061-064,066,073-076]
up infinite 1 drain cn046
up infinite 4 resv cn[069-072]
up infinite 34 alloc cn[001-021,051-060,065,067-068]
up infinite 33 idle cn[022-045,061-064,066,073-076]
up infinite 0 n/a
eschnetter@mn001:~ (13:24:40)
$



ssh symmetry
Then run the vncserver program. If this is the first time you are running it, it will ask y
password for your desktops. Please don't use your Perimeter-wide password; choose
password.
dlang@mn001:~$ vncserver
You will require a password to access your desktops.
Password:
Verify:
New 'mn001:2 (dlang)' desktop is mn001:2
Creating default startup script /home/dlang/.vnc/xstartup
Creating default config /home/dlang/.vnc/config
Starting applications specified in /home/dlang/.vnc/xstartup
Log file is /home/dlang/.vnc/mn001:2.log
If you ever forget your password, you can delete the config file where it is stored, and the n
you run vncserver it will ask you for a new password.
to reset password:
rm ~/.vnc/config
You can also run this in one step:
ssh symmetry vncserver
or
#!/bin/bash
#SBATCH --job-name=mathematica-manythreads
#SBATCH --nodes=1
#SBATCH --output=/home/eschnetter/src/c/mathematica-manythreads.out
#SBATCH --time=0:10:00
set -euxo pipefail
pwd
echo "SLURM_JOB_ID=$SLURM_JOB_ID"
date
module load mathematica
math -noprompt -script mathematica-manythreads.m
date
Downloads/mathematica-manythreads.sbatch (END)
preq up 1-00:00:00 4 resv cn[069-072]
preq up 1-00:00:00 36 alloc cn[001-021,047-048,051-060,065,067-068]
preq up 1-00:00:00 35 idle cn[022-045,049-050,061-064,066,073-076]
reservedq up infinite 1 drain cn046
reservedq up infinite 4 resv cn[069-072]
reservedq up infinite 34 alloc cn[001-021,051-060,065,067-068]
reservedq up infinite 33 idle cn[022-045,061-064,066,073-076]
eht up infinite 0 n/a
eschnetter@mn001:~ (13:24:40)
$


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:29
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build inst
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
drwx------ 8 eschnetter users 152 Aug 6 09:28 mars
-rw-r--r-- 1 eschnetter users 389 Sep 24 13:29 mathematica-manythreads.m
-rw-r--r-- 1 eschnetter users 309 Sep 24 13:29 mathematica-manythreads.sbat
ch
-rw-r--r-- 1 eschnetter users 48678 Aug 13 12:02 MaxwellToyAMReX.ipynb
drwxr-xr-x 2 eschnetter users 152 Apr 12 21:59 modules-4.15.0-47-generic-ex
tra
drwx------ 2 eschnetter users 152 Jul 9 2014 Music
-rw-r--r-- 1 eschnetter users 86 Apr 5 2017 octave-workspace
drwxr-xr-x 4 eschnetter users 152 Apr 10 2015 public_html
lrwxrwxrwx 1 eschnetter users 28 Sep 12 2018 simulations -> /gpfs/eschnet
ter/simulations
-rw-r--r-- 1 eschnetter users 3174 Oct 18 2018 slurm.conf
drwxr-xr-x 4 eschnetter users 152 Dec 6 2016 slurmstats
drwx------ 5 eschnetter users 152 Apr 17 2012 spaces-project
drwxr-xr-x 30 eschnetter users 8192 Aug 13 11:00 src
drwx------ 2 eschnetter users 152 Apr 16 11:39 _ssh
drwxr-xr-x 2 eschnetter users 152 Jul 17 2017 tmp
drwxr-xr-x 3 eschnetter users 152 Sep 9 15:36 Tutorial
-rw-r--r-- 1 eschnetter users 1416952 Sep 9 16:01 Tutorial.ipynb
-rw-r--r-- 1 eschnetter users 9347192 Mar 18 2019 TWL-MPI.zip
-rw-r--r-- 1 eschnetter users 67652 Sep 10 14:03 Untitled1.ipynb
-rw-r--r-- 1 eschnetter users 72 Sep 24 13:05 Untitled2.ipynb
-rw-r--r-- 1 eschnetter users 1989 Sep 24 13:08 Untitled3.ipynb
-rw-r--r-- 1 eschnetter users 3086 Sep 10 13:20 Untitled.ipynb
drwxr-xr-x 5 eschnetter users 152 Aug 13 16:56 visit3_0_1.linux-x86_64
drwxrwxrwx 2 eschnetter users 152 Sep 19 11:25 Wolfram Mathematica
lrwxrwxrwx 1 eschnetter users 25 Sep 12 2018 work -> /home/PI.LOCAL/eschn
etter
eschnetter@mn001:~ (13:29:39)
$


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:29
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
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Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
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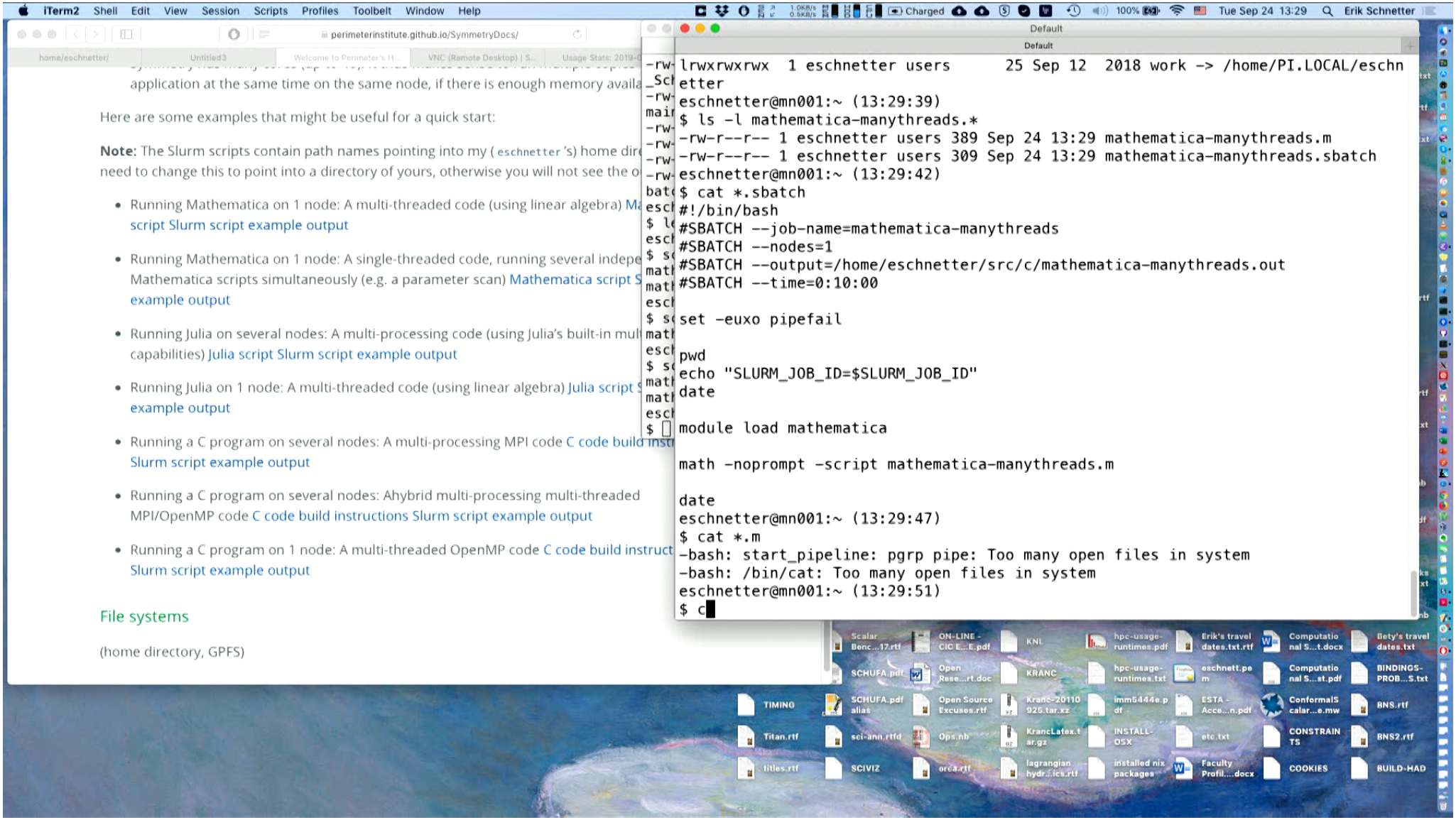
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
-rw-r--r-- 1 eschnetter users 48678 Aug 13 12:02 MaxwellToyAMReX.ipynb
drwxr-xr-x 2 eschnetter users 152 Apr 12 21:59 modules-4.15.0-47-generic-ex
tra
drwx------ 2 eschnetter users 152 Jul 9 2014 Music
-rw-r--r-- 1 eschnetter users 86 Apr 5 2017 octave-workspace
drwxr-xr-x 4 eschnetter users 152 Apr 10 2015 public_html
lrwxrwxrwx 1 eschnetter users 28 Sep 12 2018 simulations -> /gpfs/eschnet
ter/simulations
-rw-r--r-- 1 eschnetter users 3174 Oct 18 2018 slurm.conf
drwxr-xr-x 4 eschnetter users 152 Dec 6 2016 slurmstats
drwx------ 5 eschnetter users 152 Apr 17 2012 spaces-project
drwxr-xr-x 30 eschnetter users 8192 Aug 13 11:00 src
drwx------ 2 eschnetter users 152 Apr 16 11:39 _ssh
drwxr-xr-x 2 eschnetter users 152 Jul 17 2017 tmp
drwxr-xr-x 3 eschnetter users 152 Sep 9 15:36 Tutorial
-rw-r--r-- 1 eschnetter users 1416952 Sep 9 16:01 Tutorial.ipynb
-rw-r--r-- 1 eschnetter users 9347192 Mar 18 2019 TWL-MPI.zip
-rw-r--r-- 1 eschnetter users 67652 Sep 10 14:03 Untitled1.ipynb
-rw-r--r-- 1 eschnetter users 72 Sep 24 13:05 Untitled2.ipynb
-rw-r--r-- 1 eschnetter users 1989 Sep 24 13:08 Untitled3.ipynb
-rw-r--r-- 1 eschnetter users 3086 Sep 10 13:20 Untitled.ipynb
drwxr-xr-x 5 eschnetter users 152 Aug 13 16:56 visit3_0_1.linux-x86_64
drwxrwxrwx 2 eschnetter users 152 Sep 19 11:25 Wolfram Mathematica
lrwxrwxrwx 1 eschnetter users 25 Sep 12 2018 work -> /home/PI.LOCAL/eschn
etter
eschnetter@mn001:~ (13:29:39)
$ ls -l mathematica-manythreads.*
-rw-r--r-- 1 eschnetter users 389 Sep 24 13:29 mathematica-manythreads.m
-rw-r--r-- 1 eschnetter users 309 Sep 24 13:29 mathematica-manythreads.sbatch
eschnetter@mn001:~ (13:29:42)
$ cat *.s


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:29
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
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Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
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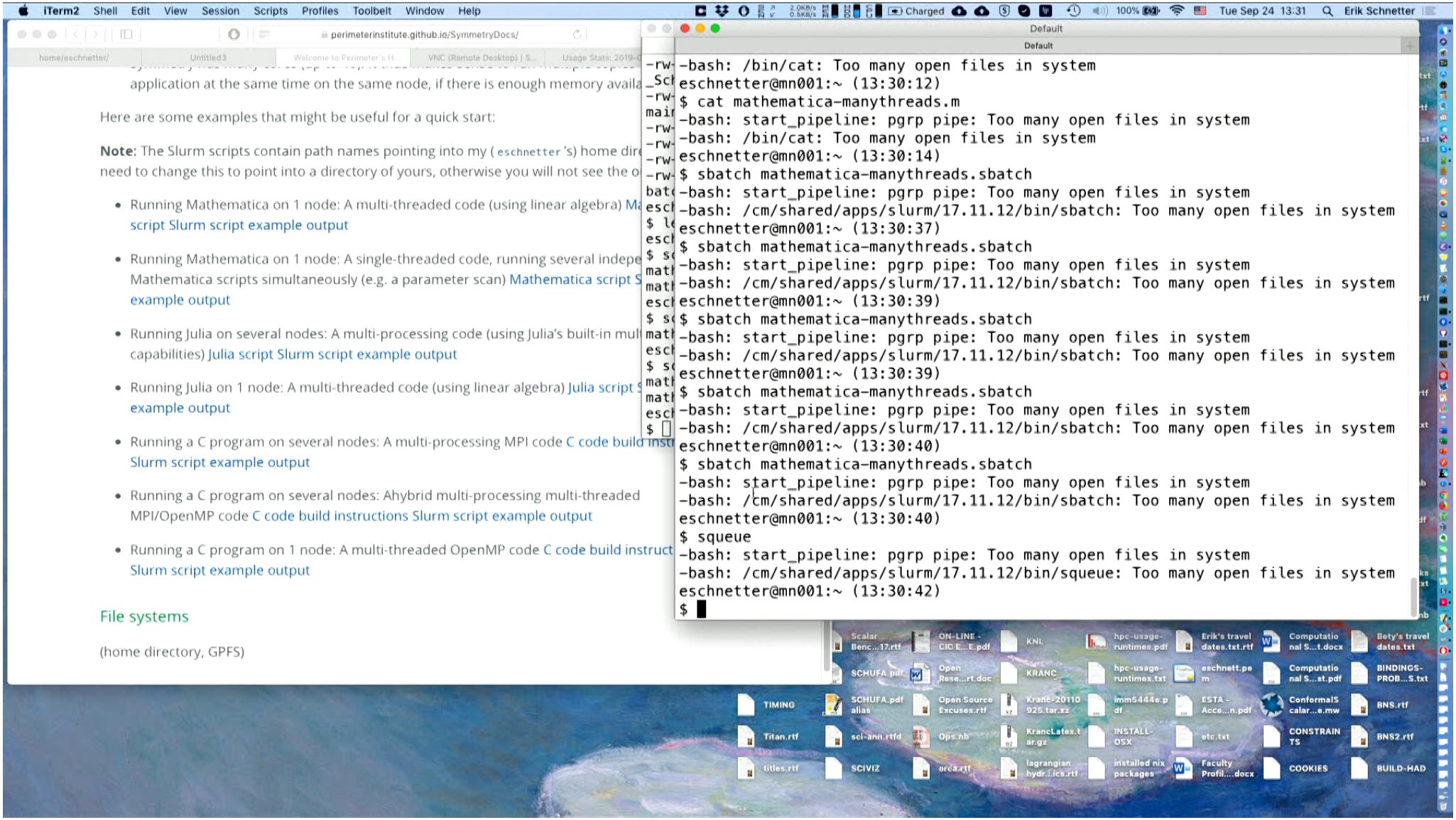
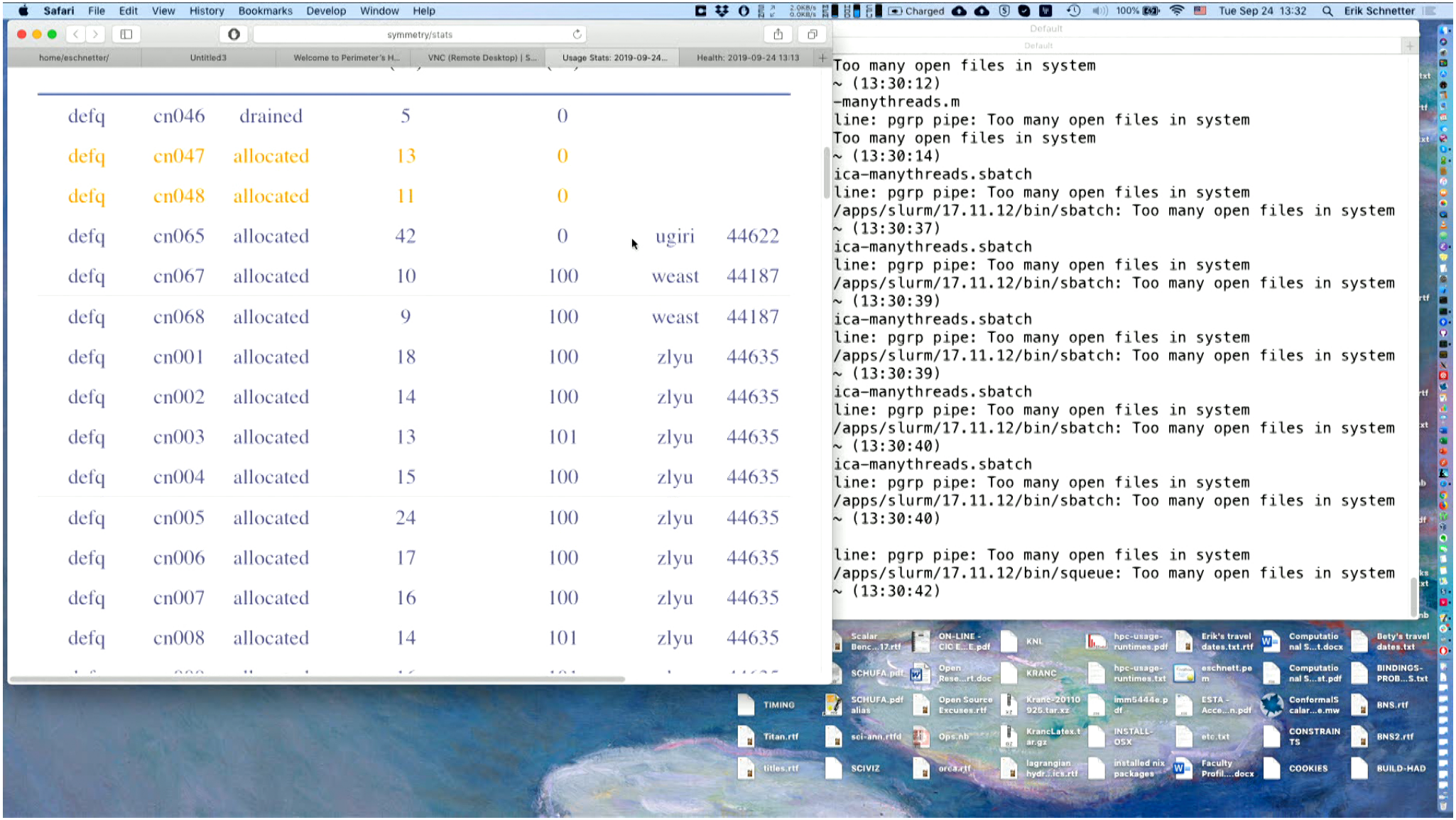
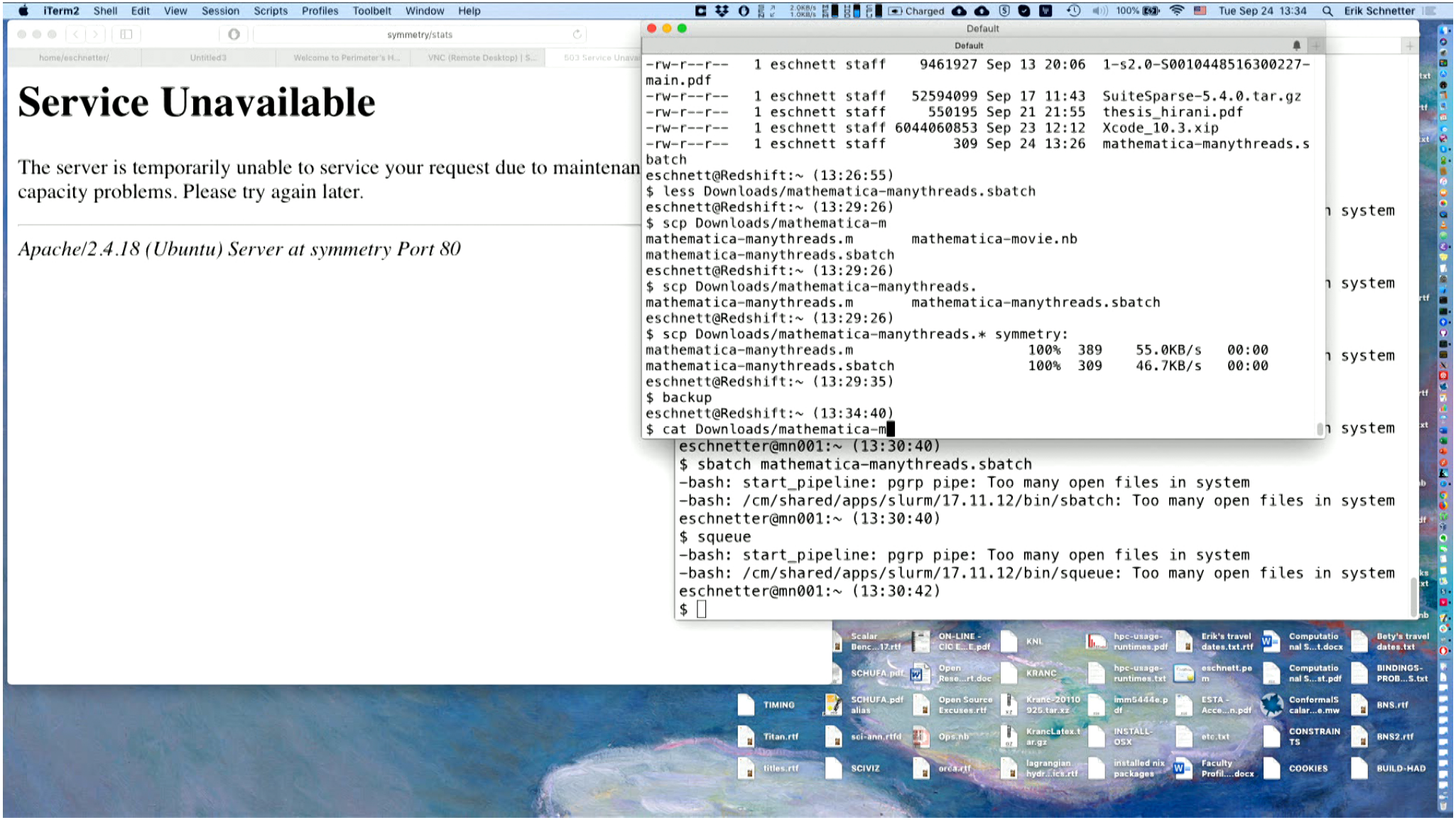
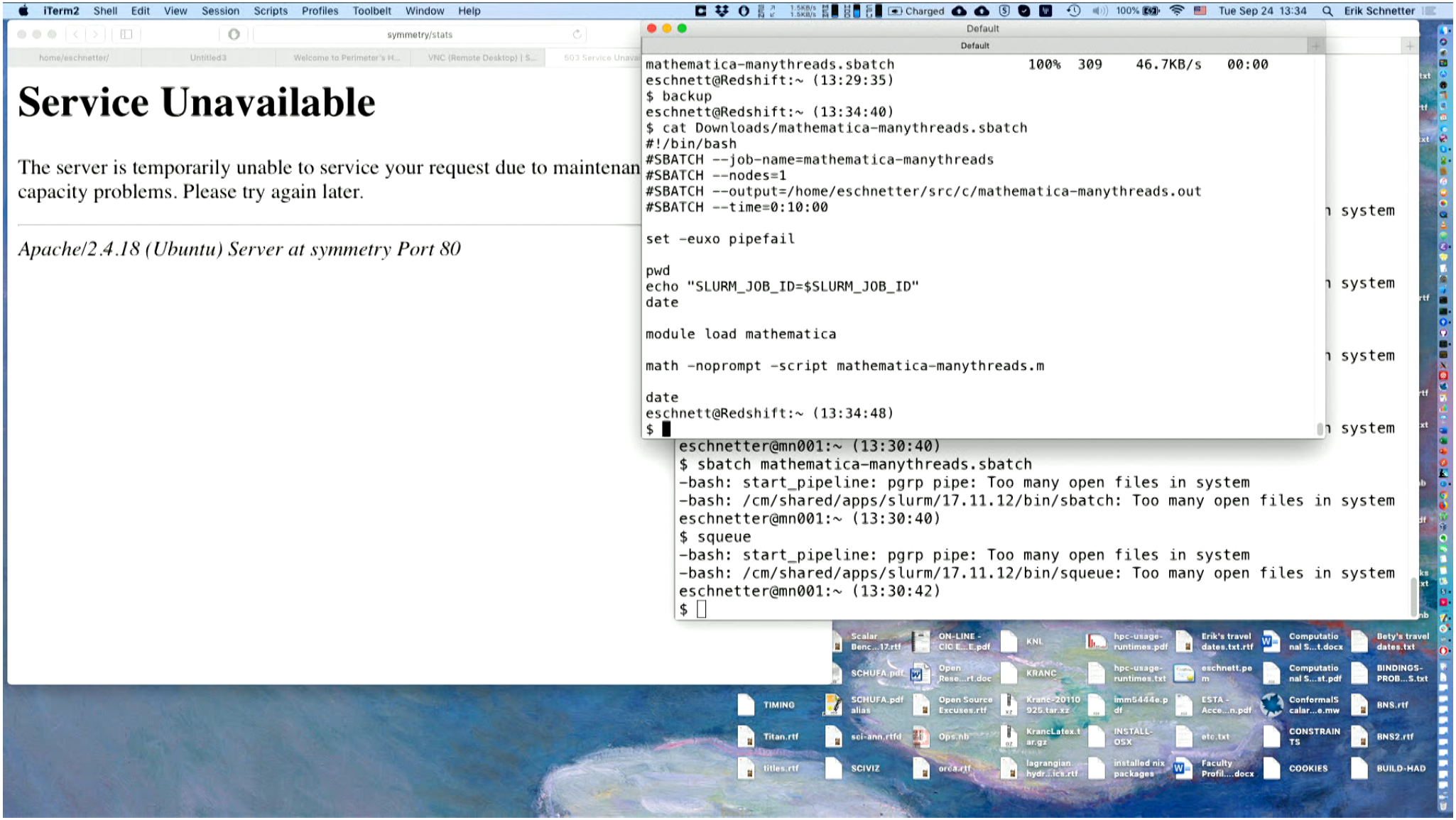
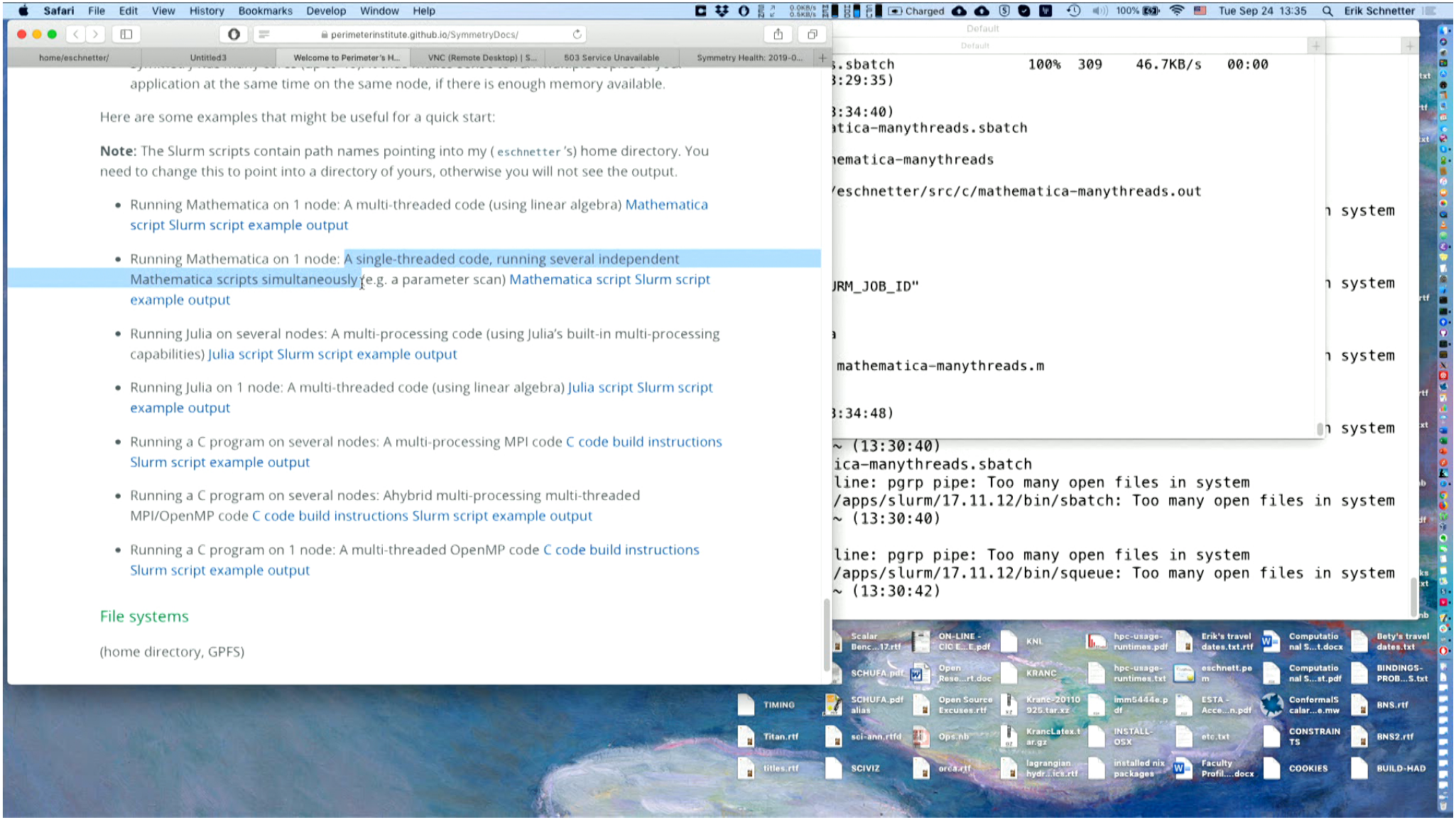
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build inst
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
lrwxrwxrwx 1 eschnetter users 25 Sep 12 2018 work -> /home/PI.LOCAL/eschn
etter
eschnetter@mn001:~ (13:29:39)
$ ls -l mathematica-manythreads.*
-rw-r--r-- 1 eschnetter users 389 Sep 24 13:29 mathematica-manythreads.m
-rw-r--r-- 1 eschnetter users 309 Sep 24 13:29 mathematica-manythreads.sbatch
eschnetter@mn001:~ (13:29:42)
$ cat *.sbatch
#!/bin/bash
#SBATCH --job-name=mathematica-manythreads
#SBATCH --nodes=1
#SBATCH --output=/home/eschnetter/src/c/mathematica-manythreads.out
#SBATCH --time=0:10:00
set -euxo pipefail
pwd
echo "SLURM_JOB_ID=$SLURM_JOB_ID"
date
module load mathematica
math -noprompt -script mathematica-manythreads.m
date
eschnetter@mn001:~ (13:29:47)
$ cat *.m
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /bin/cat: Too many open files in system
eschnetter@mn001:~ (13:29:51)
$ c

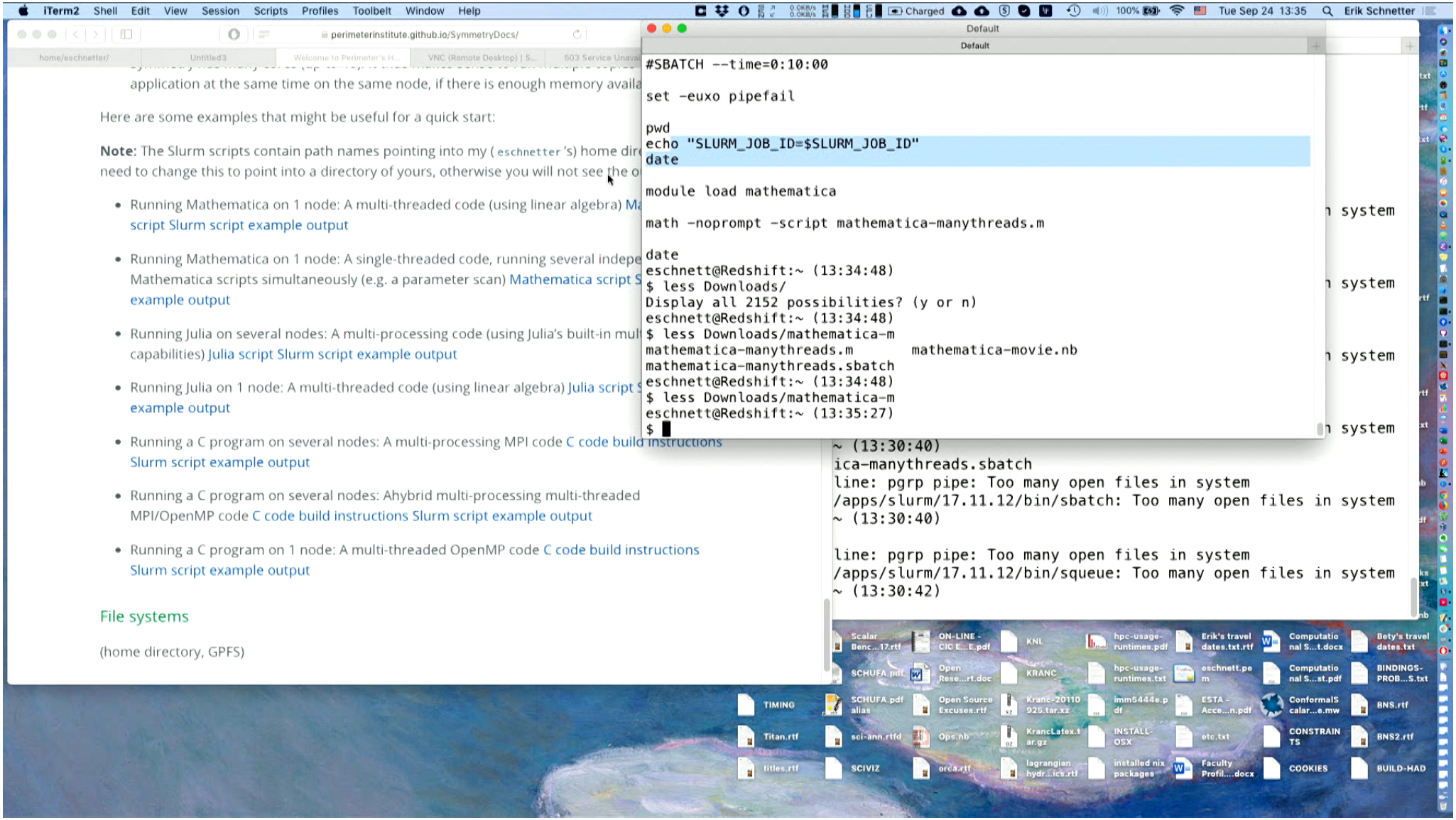

iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:31
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build inst
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
-bash: /bin/cat: Too many open files in system
eschnetter@mn001:~ (13:30:12)
$ cat mathematica-manythreads.m
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /bin/cat: Too many open files in system
eschnetter@mn001:~ (13:30:14)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:37)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:39)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:39)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:40)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:40)
$ squeue
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/squeue: Too many open files in system
eschnetter@mn001:~ (13:30:42)
$

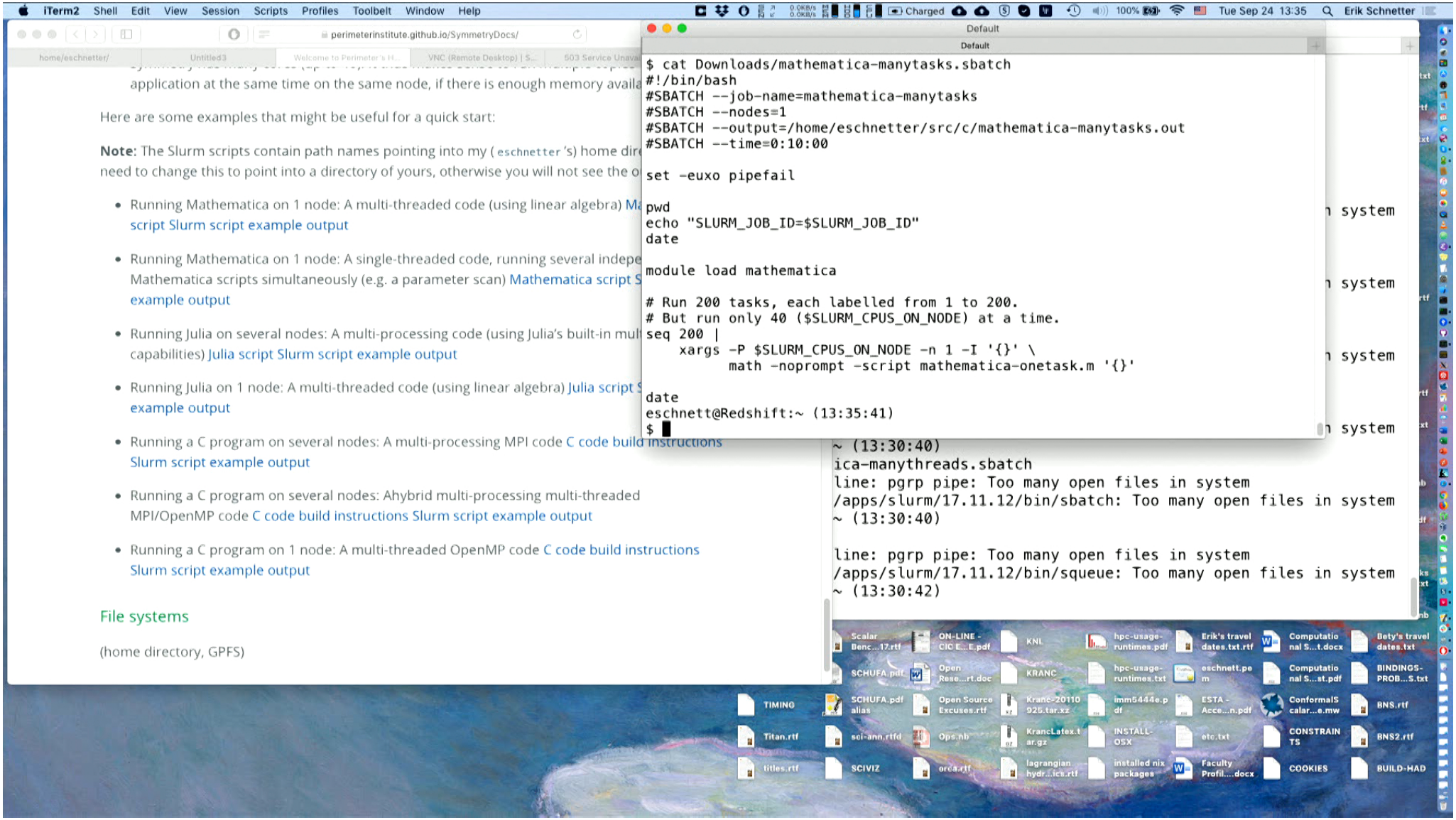

Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:32
Erik Schnetter
symmetry/stats
home/eschnetter/
Untitled3
Welcome to Perimeter's H...
VNC (Remote Desktop) | S...
Usage Stats: 2019-09-24...
Health: 2019-09-24 13:13
defq cn046 drained 5 0
defq cn047 allocated 13 0
defq cn048 allocated 11 0
defq cn065 allocated 42 0 ugiri 44622
defq cn067 allocated 10 100 weast 44187
defq cn068 allocated 9 100 weast 44187
defq cn001 allocated 18 100 zlyu 44635
defq cn002 allocated 14 100 zlyu 44635
defq cn003 allocated 13 101 zlyu 44635
defq cn004 allocated 15 100 zlyu 44635
defq cn005 allocated 24 100 zlyu 44635
defq cn006 allocated 17 100 zlyu 44635
defq cn007 allocated 16 100 zlyu 44635
defq cn008 allocated 14 101 zlyu 44635
Too many open files in system
~ (13:30:12)
-manythreads.m
line: pgrp pipe: Too many open files in system
Too many open files in system
~ (13:30:14)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:37)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:39)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:39)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)
TIMING
Titan.rtf
titles.rtf
SCHUFA.pdf
SCHUFA.pdf alias
sci-ann.rtfd
SCIVIZ
Open Source Excuses.rtf
Ops.nb
orca.rtf
KRANC
Kranc-20110925.tar.xz
KrancLatex.tar.gz
lagrangian hydr...ics.rtf
INSTALL-OSX
installed nix packages
etc.txt
Faculty Profil....docx
CONSTRAINTS
COOKIES
BNS.rtf
BNS2.rtf
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:34
Erik Schnetter
symmetry/stats
Service Unavailable
The server is temporarily unable to service your request due to maintenan
capacity problems. Please try again later.
Apache/2.4.18 (Ubuntu) Server at symmetry Port 80
Default
-rw-r--r-- 1 eschnett staff 9461927 Sep 13 20:06 1-s2.0-S0010448516300227-main.pdf
-rw-r--r-- 1 eschnett staff 52594099 Sep 17 11:43 SuiteSparse-5.4.0.tar.gz
-rw-r--r-- 1 eschnett staff 550195 Sep 21 21:55 thesis_hirani.pdf
-rw-r--r-- 1 eschnett staff 6044060853 Sep 23 12:12 Xcode_10.3.xip
-rw-r--r-- 1 eschnett staff 309 Sep 24 13:26 mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:26:55)
$ less Downloads/mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:29:26)
$ scp Downloads/mathematica-m
mathematica-manythreads.m mathematica-movie.nb
mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:29:26)
$ scp Downloads/mathematica-manythreads.
mathematica-manythreads.m mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:29:26)
$ scp Downloads/mathematica-manythreads.* symmetry:
mathematica-manythreads.m 100% 389 55.0KB/s 00:00
mathematica-manythreads.sbatch 100% 309 46.7KB/s 00:00
eschnett@Redshift:~ (13:29:35)
$ backup
eschnett@Redshift:~ (13:34:40)
$ cat Downloads/mathematica-m
eschnetter@mn001:~ (13:30:40)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:40)
$ squeue
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/squeue: Too many open files in system
eschnetter@mn001:~ (13:30:42)
$


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged 100% Tue Sep 24 13:34 Erik Schnetter
symmetry/stats
Service Unavailable
The server is temporarily unable to service your request due to maintenan
capacity problems. Please try again later.
Apache/2.4.18 (Ubuntu) Server at symmetry Port 80
Default
mathematica-manythreads.sbatch 100% 309 46.7KB/s 00:00
eschnett@Redshift:~ (13:29:35)
$ backup
eschnett@Redshift:~ (13:34:40)
$ cat Downloads/mathematica-manythreads.sbatch
#!/bin/bash
#SBATCH --job-name=mathematica-manythreads
#SBATCH --nodes=1
#SBATCH --output=/home/eschnetter/src/c/mathematica-manythreads.out
#SBATCH --time=0:10:00
set -euxo pipefail
pwd
echo "SLURM_JOB_ID=$SLURM_JOB_ID"
date
module load mathematica
math -noprompt -script mathematica-manythreads.m
date
eschnett@Redshift:~ (13:34:48)
$
eschnetter@mn001:~ (13:30:40)
$ sbatch mathematica-manythreads.sbatch
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
eschnetter@mn001:~ (13:30:40)
$ squeue
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /cm/shared/apps/slurm/17.11.12/bin/squeue: Too many open files in system
eschnetter@mn001:~ (13:30:42)
$


Safari File Edit View History Bookmarks Develop Window Help
Tue Sep 24 13:35
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
home/eschnetter/
Untitled3
Welcome to Perimeter's H...
VNC (Remote Desktop) | S...
503 Service Unavailable
Symmetry Health: 2019-0...
application at the same time on the same node, if there is enough memory available.
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home directory. You need to change this to point into a directory of yours, otherwise you will not see the output.
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Mathematica script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several independent Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script Slurm script example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in multi-processing capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script Slurm script example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions Slurm script example output
File systems
(home directory, GPFS)
.sbatch 100% 309 46.7KB/s 00:00
3:29:35)
3:34:40)
atica-manythreads.sbatch
hematica-manythreads
/eschnetter/src/c/mathematica-manythreads.out
n system
URM_JOB_ID"
n system
mathematica-manythreads.m
n system
3:34:48)
n system
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)
Scalar Benc...17.rtf
ON-LINE - CIC E...E.pdf
KNL
hpc-usage-runtimes.pdf
Erik's travel dates.txt.rtf
Computational S...t.docx
Bety's travel dates.txt
SCHUFA.pdf
Open Rese...rt.doc
KRANC
hpc-usage-runtimes.txt
eschnett.pem
Computational S...st.pdf
BINDINGS-PROB...S.txt
TIMING
SCHUFA.pdf alias
Open Source Excuses.rtf
Kranc-20110925.tar.xz
imm5444e.pdf
ESTA - Acce...n.pdf
ConformalScalar...e.mw
BNS.rtf
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:35
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions
Slurm script example output
File systems
(home directory, GPFS)
Default
#SBATCH --time=0:10:00
set -euxo pipefail
pwd
echo "SLURM_JOB_ID=$SLURM_JOB_ID"
date
module load mathematica
math -noprompt -script mathematica-manythreads.m
date
eschnett@Redshift:~ (13:34:48)
$ less Downloads/
Display all 2152 possibilities? (y or n)
eschnett@Redshift:~ (13:34:48)
$ less Downloads/mathematica-m
mathematica-manythreads.m mathematica-movie.nb
mathematica-manythreads.sbatch
eschnett@Redshift:~ (13:34:48)
$ less Downloads/mathematica-m
eschnett@Redshift:~ (13:35:27)
$
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:35
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Running Mathematica on 1 node: A single-threaded code, running several indepe
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example output
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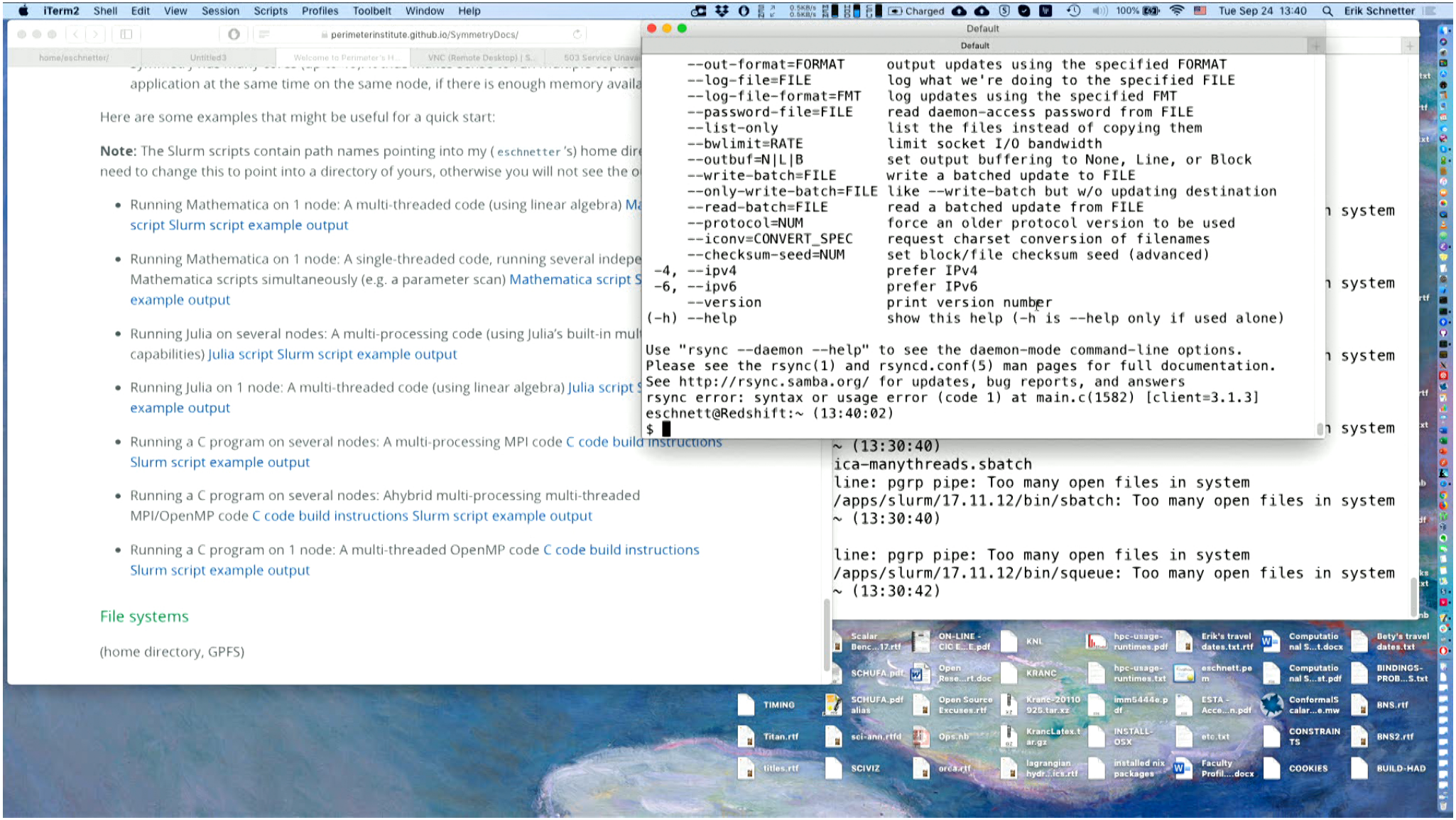
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
$ cat Downloads/mathematica-manytasks.sbatch
#!/bin/bash
#SBATCH --job-name=mathematica-manytasks
#SBATCH --nodes=1
#SBATCH --output=/home/eschnetter/src/c/mathematica-manytasks.out
#SBATCH --time=0:10:00
set -euxo pipefail
pwd
echo "SLURM_JOB_ID=$SLURM_JOB_ID"
date
module load mathematica
Run 200 tasks, each labelled from 1 to 200.
But run only 40 ($SLURM_CPUS_ON_NODE) at a time.
seq 200 |
xargs -P $SLURM_CPUS_ON_NODE -n 1 -I '{}' \
math -noprompt -script mathematica-onetask.m '{}'
date
eschnett@Redshift:~ (13:35:41)
$
n system
n system
n system
n system
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)
Scalar Benc...17.rtf
ON-LINE - CIC E...E.pdf
KNL
hpc-usage-runtimes.pdf
Erik's travel dates.txt.rtf
Computational S...t.docx
Bety's travel dates.txt
SCHUFA.pdf
Open Rese...rt.doc
KRANC
hpc-usage-runtimes.txt
eschnett.pem
Computational S...st.pdf
BINDINGS-PROB...S.txt
TIMING
SCHUFA.pdf alias
Open Source Excuses.rtf
Kranc-20110925.tar.xz
imm5444e.pdf
ESTA - Acce...n.pdf
ConformalScalar...e.mw
BNS.rtf
Titan.rtf
sci-ann.rtfd
Ops.nb
KrancLatex.tar.gz
INSTALL-OSX
etc.txt
CONSTRAINTS
BNS2.rtf
titles.rtf
SCIVIZ
orca.rtf
lagrangian hydr...ics.rtf
installed nix packages
Faculty Profil....docx
COOKIES
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:40
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
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Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
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Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
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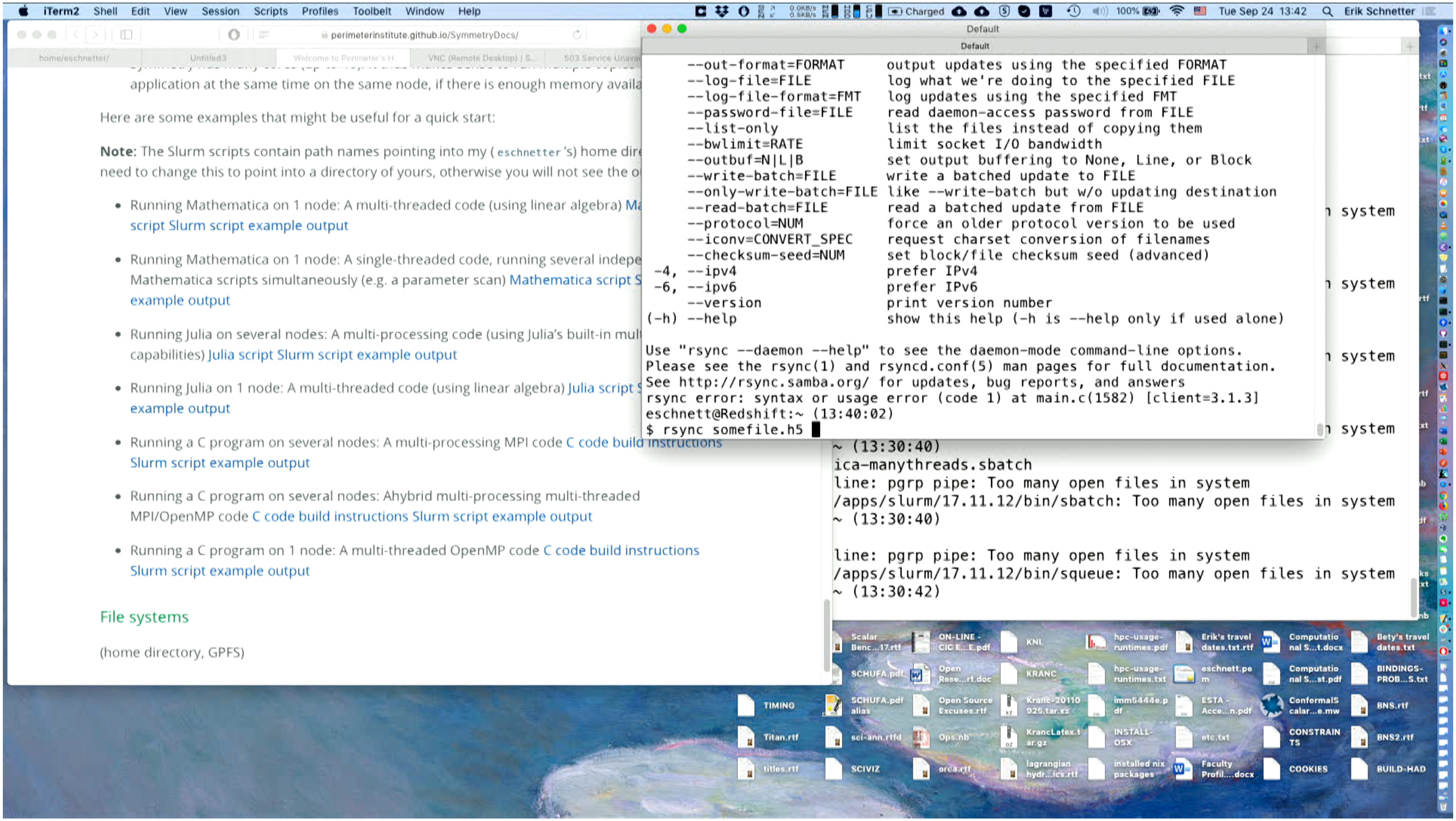
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
--out-format=FORMAT output updates using the specified FORMAT
--log-file=FILE log what we're doing to the specified FILE
--log-file-format=FMT log updates using the specified FMT
--password-file=FILE read daemon-access password from FILE
--list-only list the files instead of copying them
--bwlimit=RATE limit socket I/O bandwidth
--outbuf=N|L|B set output buffering to None, Line, or Block
--write-batch=FILE write a batched update to FILE
--only-write-batch=FILE like --write-batch but w/o updating destination
--read-batch=FILE read a batched update from FILE
--protocol=NUM force an older protocol version to be used
--iconv=CONVERT_SPEC request charset conversion of filenames
--checksum-seed=NUM set block/file checksum seed (advanced)
-4, --ipv4 prefer IPv4
-6, --ipv6 prefer IPv6
--version print version number
(-h) --help show this help (-h is --help only if used alone)
Use "rsync --daemon --help" to see the daemon-mode command-line options.
Please see the rsync(1) and rsyncd.conf(5) man pages for full documentation.
See http://rsync.samba.org/ for updates, bug reports, and answers
rsync error: syntax or usage error (code 1) at main.c(1582) [client=3.1.3]
eschnett@Redshift:~ (13:40:02)
$
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Charged
100%
Tue Sep 24 13:42
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter's) home dire
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build instructions
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions
Slurm script example output
File systems
(home directory, GPFS)
Default
--out-format=FORMAT output updates using the specified FORMAT
--log-file=FILE log what we're doing to the specified FILE
--log-file-format=FMT log updates using the specified FMT
--password-file=FILE read daemon-access password from FILE
--list-only list the files instead of copying them
--bwlimit=RATE limit socket I/O bandwidth
--outbuf=N|L|B set output buffering to None, Line, or Block
--write-batch=FILE write a batched update to FILE
--only-write-batch=FILE like --write-batch but w/o updating destination
--read-batch=FILE read a batched update from FILE
--protocol=NUM force an older protocol version to be used
--iconv=CONVERT_SPEC request charset conversion of filenames
--checksum-seed=NUM set block/file checksum seed (advanced)
-4, --ipv4 prefer IPv4
-6, --ipv6 prefer IPv6
--version print version number
(-h) --help show this help (-h is --help only if used alone)
Use "rsync --daemon --help" to see the daemon-mode command-line options.
Please see the rsync(1) and rsyncd.conf(5) man pages for full documentation.
See http://rsync.samba.org/ for updates, bug reports, and answers
rsync error: syntax or usage error (code 1) at main.c(1582) [client=3.1.3]
eschnett@Redshift:~ (13:40:02)
$ rsync somefile.h5
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)

application at the same time on the same node, if there is enough memory availa

Here are some examples that might be useful for a quick start:

Note: The Slurm scripts contain path names pointing into my (`eschnetter`'s) home dir
need to change this to point into a directory of yours, otherwise you will not see the o

- Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma script Slurm script example output
- Running Mathematica on 1 node: A single-threaded code, running several indepe Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S example output
- Running Julia on several nodes: A multi-processing code (using Julia's built-in mul capabilities) Julia script Slurm script example output
- Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S example output
- Running a C program on several nodes: A multi-processing MPI code C code build instructions Slurm script example output
- Running a C program on several nodes: Ahybrid multi-processing multi-threaded MPI/OpenMP code C code build instructions Slurm script example output
- Running a C program on 1 node: A multi-threaded OpenMP code C code build instructions Slurm script example output

File systems

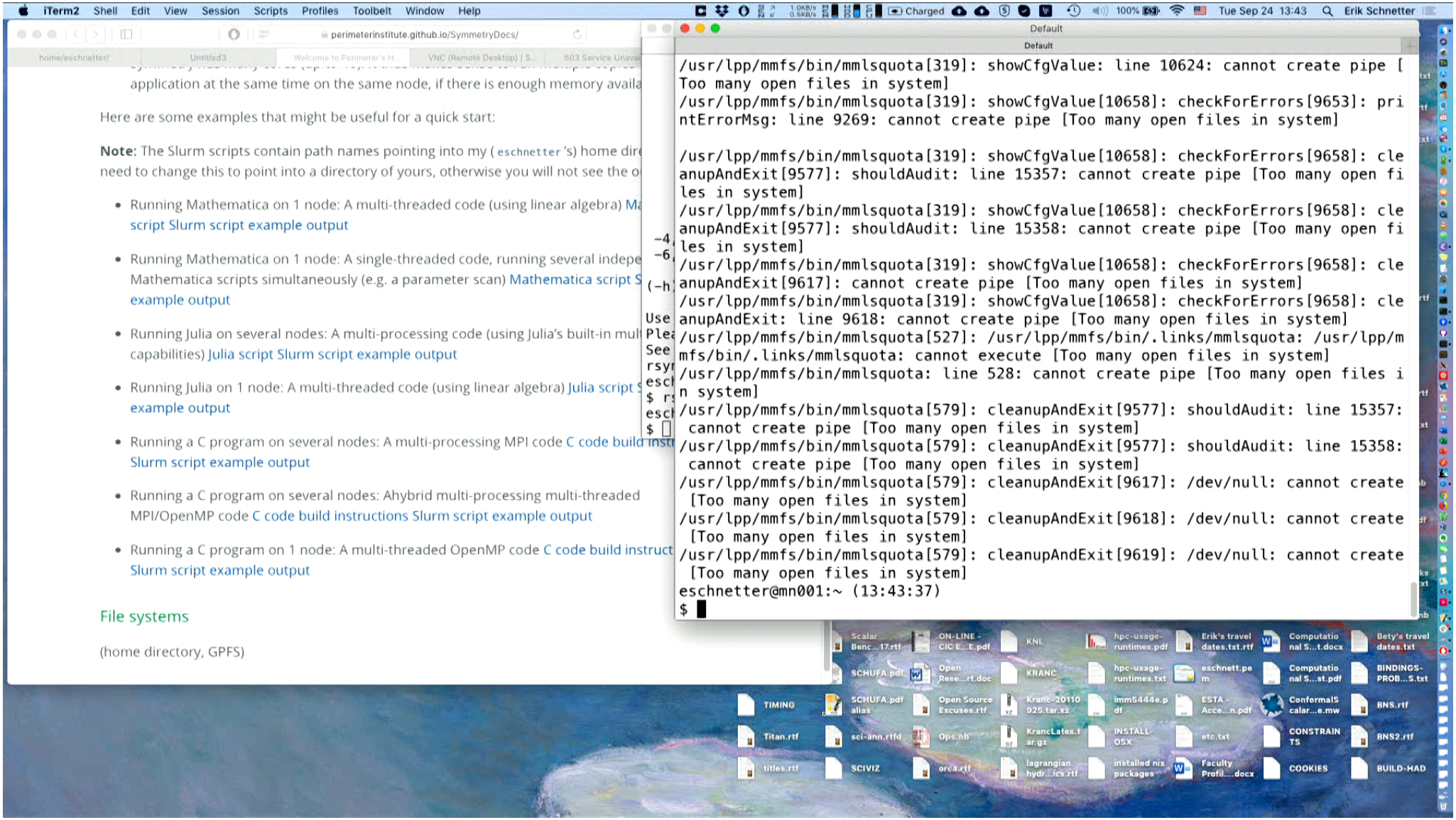
(home directory, GPFS)

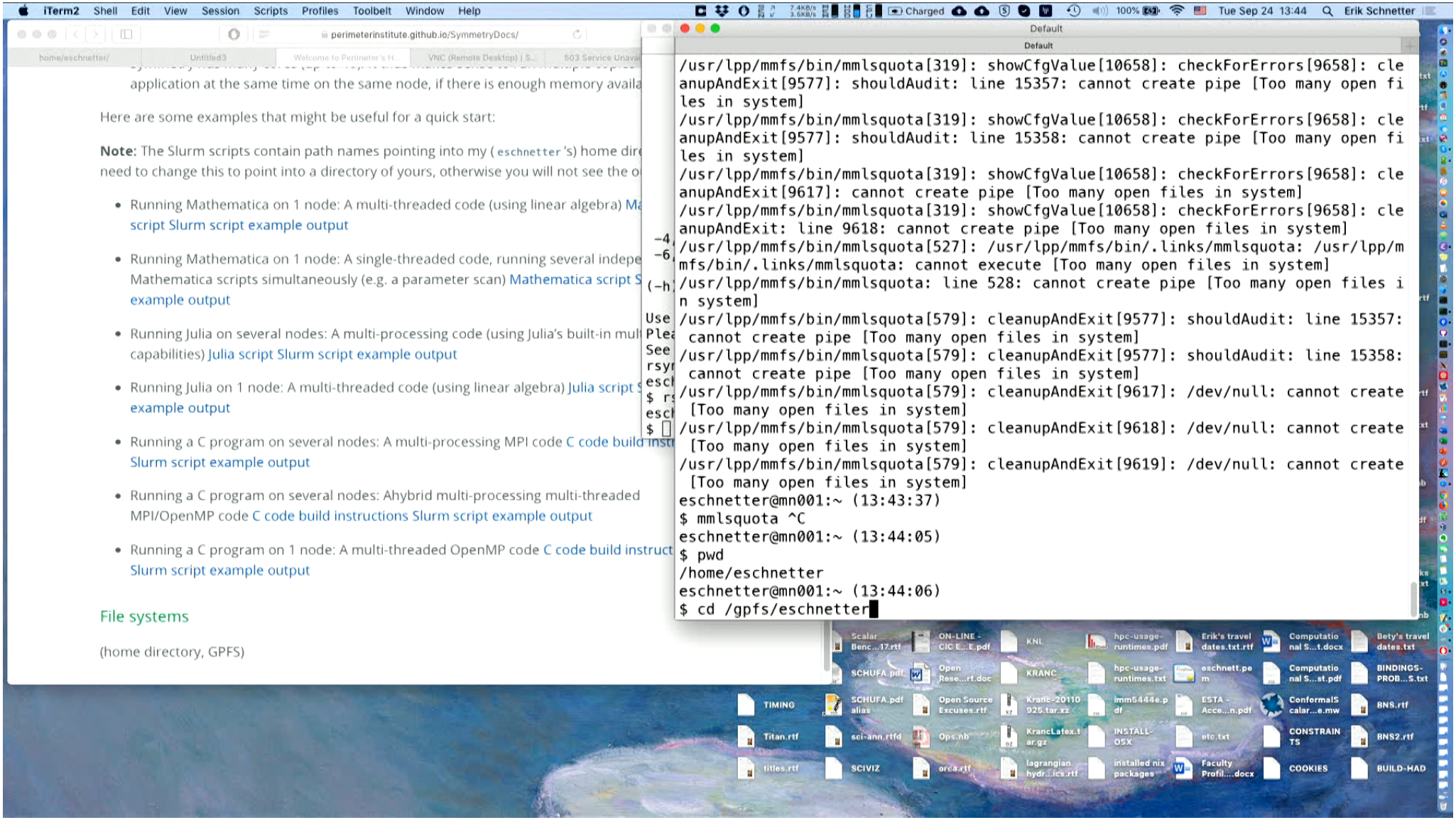
```
    --log-file-format=FMT   log updates using the specified FMT
    --password-file=FILE    read daemon-access password from FILE
    --list-only             list the files instead of copying them
    --bwlimit=RATE          limit socket I/O bandwidth
    --outbuf=N|L|B          set output buffering to None, Line, or Block
    --write-batch=FILE      write a batched update to FILE
    --only-write-batch=FILE like --write-batch but w/o updating destination
    --read-batch=FILE       read a batched update from FILE
    --protocol=NUM          force an older protocol version to be used
    --iconv=CONVERT_SPEC    request charset conversion of filenames
    --checksum-seed=NUM     set block/file checksum seed (advanced)
-4, --ipv4                  prefer IPv4
-6, --ipv6                  prefer IPv6
    --version               print version number
(-h) --help                 show this help (-h is --help only if used alone)

Use "rsync --daemon --help" to see the daemon-mode command-line options.
Please see the rsync(1) and rsyncd.conf(5) man pages for full documentation.
See http://rsync.samba.org/ for updates, bug reports, and answers
rsync error: syntax or usage error (code 1) at main.c(1582) [client=3.1.3]
eschnett@Redshift:~ (13:40:02)
$ rsync -e 'ssh  somefile.h5 mars.perimeterinstute.ca:
eschnett@Redshift:~ (13:43:01)
$
```

```
~ (13:30:40)
ica-manythreads.sbatch
line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/sbatch: Too many open files in system
~ (13:30:40)

line: pgrp pipe: Too many open files in system
/apps/slurm/17.11.12/bin/squeue: Too many open files in system
~ (13:30:42)
```


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:43
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
Running Mathematica on 1 node: A single-threaded code, running several indepe
Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
capabilities) Julia script Slurm script example output
Running Julia on 1 node: A multi-threaded code (using linear algebra) Julia script S
example output
Running a C program on several nodes: A multi-processing MPI code C code build instr
Slurm script example output
Running a C program on several nodes: Ahybrid multi-processing multi-threaded
MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue: line 10624: cannot create pipe [
Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9653]: pri
ntErrorMsg: line 9269: cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit[9577]: shouldAudit: line 15357: cannot create pipe [Too many open fi
les in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit[9577]: shouldAudit: line 15358: cannot create pipe [Too many open fi
les in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit[9617]: cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit: line 9618: cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[527]: /usr/lpp/mmfs/bin/.links/mmlsquota: /usr/lpp/m
mfs/bin/.links/mmlsquota: cannot execute [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota: line 528: cannot create pipe [Too many open files i
n system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9577]: shouldAudit: line 15357:
cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9577]: shouldAudit: line 15358:
cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9617]: /dev/null: cannot create
[Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9618]: /dev/null: cannot create
[Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9619]: /dev/null: cannot create
[Too many open files in system]
eschnetter@mn001:~ (13:43:37)
$
TIMING
Titan.rtf
titles.rtf
SCHUFA.pdf
SCHUFA.pdf alias
sci-ann.rtfd
SCIVIZ
Open Source Excuses.rtf
Ops.nb
orca.rtf
Krane-20110925.tar.xz
KraneLatex.tar.gz
lagrangian hydr...ics.rtf
imm5444e.pdf
INSTALL-OSX
installed nix packages
ESTA - Acce...n.pdf
etc.txt
Faculty Profil....docx
ConformalScalar...e.mw
CONSTRAINTS
COOKIES
BNS.rtf
BNS2.rtf
BUILD-HAD


iTerm2 Shell Edit View Session Scripts Profiles Toolbelt Window Help
Tue Sep 24 13:44
Erik Schnetter
perimeterinstitute.github.io/SymmetryDocs/
application at the same time on the same node, if there is enough memory availa
Here are some examples that might be useful for a quick start:
Note: The Slurm scripts contain path names pointing into my (eschnetter 's) home dir
need to change this to point into a directory of yours, otherwise you will not see the o
Running Mathematica on 1 node: A multi-threaded code (using linear algebra) Ma
script Slurm script example output
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Mathematica scripts simultaneously (e.g. a parameter scan) Mathematica script S
example output
Running Julia on several nodes: A multi-processing code (using Julia's built-in mul
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MPI/OpenMP code C code build instructions Slurm script example output
Running a C program on 1 node: A multi-threaded OpenMP code C code build instruct
Slurm script example output
File systems
(home directory, GPFS)
Default
Default
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit[9577]: shouldAudit: line 15357: cannot create pipe [Too many open fi
les in system]
/usr/lpp/mmfs/bin/mmlsquota[319]: showCfgValue[10658]: checkForErrors[9658]: cle
anupAndExit[9577]: shouldAudit: line 15358: cannot create pipe [Too many open fi
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anupAndExit[9617]: cannot create pipe [Too many open files in system]
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anupAndExit: line 9618: cannot create pipe [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[527]: /usr/lpp/mmfs/bin/.links/mmlsquota: /usr/lpp/m
mfs/bin/.links/mmlsquota: cannot execute [Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota: line 528: cannot create pipe [Too many open files i
n system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9577]: shouldAudit: line 15357:
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/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9617]: /dev/null: cannot create
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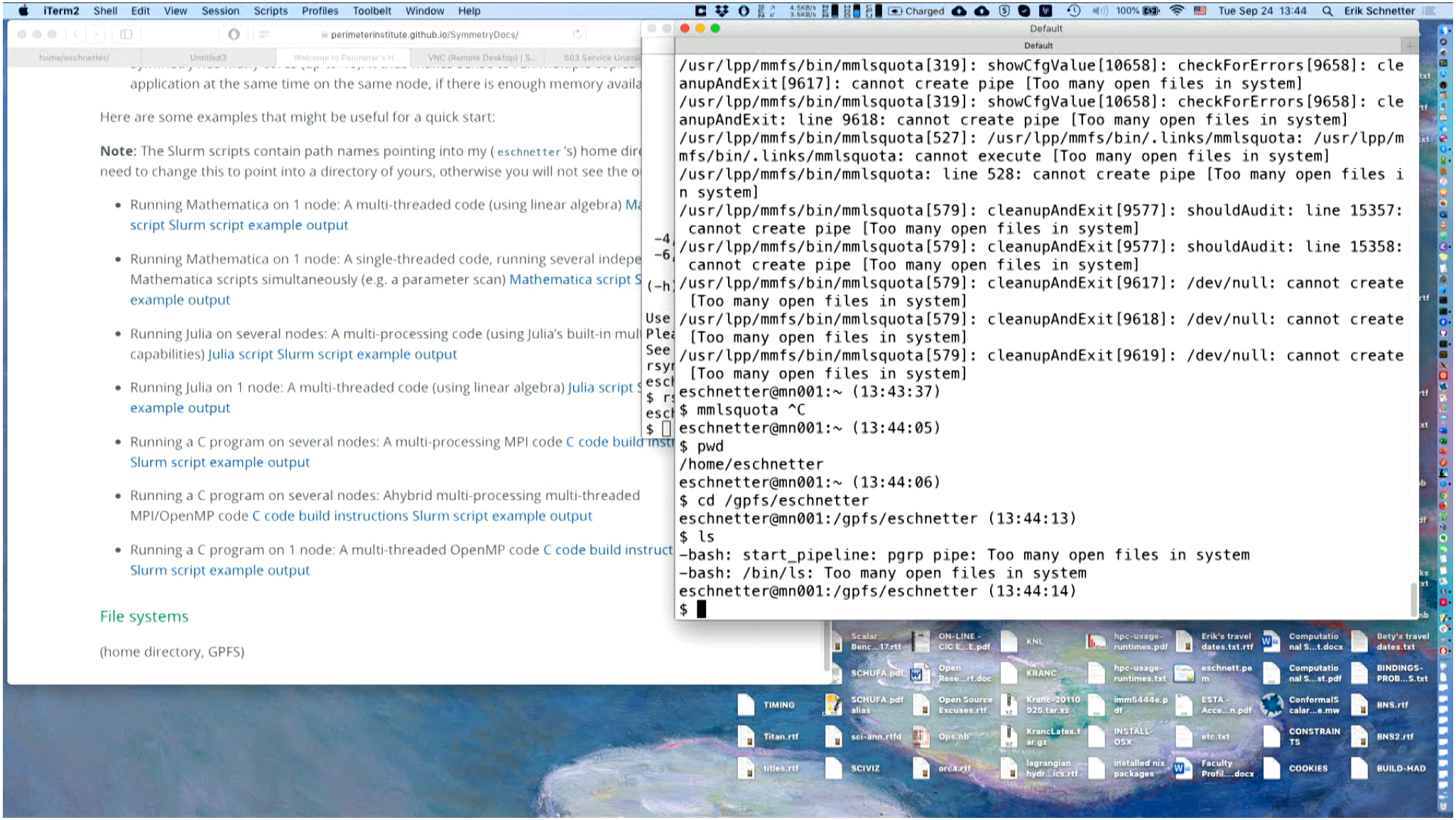
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9618]: /dev/null: cannot create
[Too many open files in system]
/usr/lpp/mmfs/bin/mmlsquota[579]: cleanupAndExit[9619]: /dev/null: cannot create
[Too many open files in system]
eschnetter@mn001:~ (13:43:37)
$ mmlsquota ^C
eschnetter@mn001:~ (13:44:05)
$ pwd
/home/eschnetter
eschnetter@mn001:~ (13:44:06)
$ cd /gpfs/eschnetter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$ mmlsquota ^C
eschnetter@mn001:~ (13:44:05)
$ pwd
/home/eschnetter
eschnetter@mn001:~ (13:44:06)
$ cd /gpfs/eschnetter
eschnetter@mn001:/gpfs/eschnetter (13:44:13)
$ ls
-bash: start_pipeline: pgrp pipe: Too many open files in system
-bash: /bin/ls: Too many open files in system
eschnetter@mn001:/gpfs/eschnetter (13:44:14)
$