L17, 2 April:  VisIt-HPC-batch version 2, movies

1) Launch these programs on your computer (lab or labtop)
FileZilla or Fugu
Putty or Terminal
NotePad++ or TextEdit or TextWrangler

2) Task:   Update the visit key in your .soft file.
old:  +visit-2.3.2
new:  +visit-2.4.0

To make this change, you have at least two editing options.  Pick one.
There is the "least keystroke option" on slide #2 using the vi editor.

There is the "least new commands option" on slide #3 using FileZilla, NotePad++,
FileZilla, and the unix copy commands.

(1a) Updating .soft with the vi editor.  There is a vi editor cheat sheet on Moodle/ Week 12.  The commands we use are:

arrow keys for navigation through file.  **Do not touch the mouse in vi!!**

"i"  to enter insert mode and put characters before cursor.  Note delete & backspace keys.

"esc key" to exit the insert mode

":wq" to write file and quit editor.  Note: when you type ":wq", it will appear at the very bottom of your terminal window.  Depending on file permission, you may get a warning to use ":wq!" to save your file.

```
[lbutler@philip1 ~]$ vi .soft

#
# This is the .soft file.
# It is used to customize your environment by setting up environment
# variables such as PATH and MANPATH.
# To learn what can be in this file, use 'man softenv'.
#
+visit-2.4.0
+mpich2-1.4.1p1-gcc-4.3.2
+gcc-4.3.2
#
@default
~
```

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(1b) Updating .soft FileZilla, NotePad++, FileZilla command

- FileZilla:  connect to tezpur.hpc.lsu.edu and set the path
    to/project/lbutler/students/your name/
- Putty: Copy your .soft from Philip to Tezpur where FileZilla can get it.

For these instruction to make sense, we need to get to the same folder, so

    $ cd ~

should get you to  [yourname@philip1 ~]$

    $ pwd

should show /home/yourname

    $ cp .soft /project/lbutler/students/yourname/

```
[lbutler@philip1 ~]$ vi .soft

#
# This is the .soft file.
# It is used to customize your env
# variables such as PATH and MANP
# To learn what can be in this fi
#
+visit-2.4.0
+mpich2-1.4.1p1-gcc-4.3.2
+gcc-4.3.2
#
@default
~
```

- FileZilla:  copy .soft from Tezpur to your desktop or laptop
- NotePad++ or TextWranger:  edit .soft to get the new visit key
- FileZilla: send the new version back to Tezpur
- Putty:
    $ cd ~   (just being careful)
    $ cp /project/lbutler/students/yourname/.soft   .

note the two periods in this command

3

(2a) Let's review the 4 files that should be in your directories on Philip and Tezpur

.soft  -  tells your account where the VisIt application is

```
[lbutler@philip1 ~]$ cd ~
[lbutler@philip1 ~]$ more .soft
#
# This is the .soft file.
# It is used to customize your environment by setting up environment
# variables such as PATH and MANPATH.
# To learn what can be in this file, use 'man softenv'.
#
+visit-2.4.0
+mpich2-1.4.1p1-gcc-4.3.2
+gcc-4.3.2
#
@default
[lbutler@philip1 ~]$ 
```

**(2b)** Let's review the **second file** that should be in your directories on Philip and Tezpur

.visit/hosts/host_philip.xml - has some parameters for the VisIt application

```
[lbutler@philip1 ~]$ cd ~
[lbutler@philip1 ~]$ more .visit/hosts/host_philip.xml
<?xml version="1.0"?>
<Object name="MachineProfile">
    <Field name="hostNickname" type="string">Philip</Field>
    <Field name="host" type="string">philip.lsu.edu</Field>
    <Field name="userName" type="string">notset</Field>
    <Field name="hostAliases" type="string">"philip### philip#"</Field>
    <Field name="directory" type="string"></Field>
    <Field name="shareOneBatchJob" type="bool">false</Field>
    <Field name="sshPortSpecified" type="bool">false</Field>
    <Field name="sshPort" type="int">22</Field>
    <Field name="useGateway" type="bool">false</Field>
    <Field name="gatewayHost" type="string"></Field>
    <Field name="clientHostDetermination" type="string">MachineName</Field>
    <Field name="manualClientHostName" type="string"></Field>
    <Field name="tunnelSSH" type="bool">false</Field>
    <Object name="LaunchProfile">
        <Field name="timeout" type="int">480</Field>
        <Field name="numProcessors" type="int">8</Field>
        <Field name="numNodesSet" type="bool">true</Field>
        <Field name="numNodes" type="int">1</Field>
        <Field name="partitionSet" type="bool">false</Field>
        <Field name="partition" type="string"></Field>
        <Field name="bankSet" type="bool">false</Field>
```

(2c) Let's review the **third file** that should be in your directories on Philip and Tezpur

/project/lbutler/students/yourname/something.txt - is a batch submission file.
How many nodes? How much walltime? What is the application?
And what are the parameters and source file for the application?

```
[lbutler@philip1 ~]$ cd ~
[lbutler@philip1 ~]$ more /project/lbutler/students/les/visit_python_batch_script.txt
#!/bin/bash

#PBS -l nodes=1:ppn=8
#PBS -l walltime=00:10:00
#PBS -N visit_python
#PBS -o visit_python_output.txt
#PBS -e visit_python_error.txt
#PBS -q priority
#PBS -m e
#PBS -M lbutler@lsu.edu

cd ~
visit -cli -nowin -s /project/lbutler/students/les/Movie_MAS_2.py
```

**(2d)** Let's review the **fourth file** that should be in your directories on Philip and Tezpur

/project/lbutler/students/yourname/something.py - is a VisIt Python script.
   Where is the data? What kind of plot? What parameter is varied?

```
[lbutler@philip1 ~]$ cd ~
[lbutler@philip1 ~]$ more /project/lbutler/students/les/Movie_MAS_2.py
import os
import sys

# Read the *.h5 data file
OpenDatabase("/project/lbutler/data_materials/MAS_rotor/MAS_rotor_cropped.h5")

# Create window attributes.
s = SaveWindowAttributes()
s.format = s.JPEG
s.outputToCurrentDirectory = 0
s.outputDirectory = "/project/lbutler/students/les"
s.fileName = "Les_volume_increase_opacity_"
s.width, s.height = 600, 400
s.screenCapture = 0
s.progressive = 1
SetSaveWindowAttributes(s)

# Create a plot
AddPlot("Volume", "volMAS")
va = VolumeAttributes()
va.opacityAttenuation = 0.75
va.colorVarMin = 32500
```

**(2d)** Let's review the **fourth file** that should be in your directories on Philip and Tezpur

/project/lbutler/students/yourname/something.py  -  is a VisIt Python script.
   Where is the data?  What kind of plot?  What parameter is varied?

```
legendLabelAxisStaff= AnnotationAttributes()
legendLabelAxisStaff.userInfoFlag = 0
legendLabelAxisStaff.databaseInfoFlag = 0
legendLabelAxisStaff.legendInfoFlag = 0
legendLabelAxisStaff.axes3D.visible = 0
legendLabelAxisStaff.axesArray.visible = 0
legendLabelAxisStaff.triadFlag = 0
SetAnnotationAttributes(legendLabelAxisStaff)

# Loop over a range of opacity values and save the plots
for j in range(255,5,-10):
        ffo = range(0,256)
        for i in ffo:
                if i <= j:
                        ffo[i] = 0
                else:
                        ffo[i] = 255
        va.freeformOpacity = tuple(ffo)
        SetPlotOptions(va)
        DrawPlots()
        name = SaveWindow()

sys.exit()
```

Reasonable values for range command are:
range(255,5,-5)   yields 51 images
range(255,5,-10) yields 26 images ~10 minutes on 1 node
range(255,1,-1)   yields 255 images

(15)  Submitting the batch job.

My preference is to submit from home directory on Philip, so cd ~

```
[lbutler@philip1 les]$ cd /home/lbutler
[lbutler@philip1 ~]$ ls
[lbutler@philip1 ~]$ qsub /project/lbutler/students/les/visit_python_batch_script.txt
135369.philip1
[lbutler@philip1 ~]$ qstat
Job id                    Name             User            Time Use S Queue
------------------------- ---------------- --------------- -------- - -----
134321.philip1            vmd_cowX_woLigs  rcroch2                0 Q workq
134631.philip1            jobFS7.sh        michal                0 Q workq
134784.philip1            Trib.Q10         ritt           23:16:24 R single
135174.philip1            Mnet3no          qsheng1        677:07:4 R single
135184.philip1            gb_s4_43.04      ghoshbd        00:00:00 R checkpt
135185.philip1            gb_s4_43.04      ghoshbd        00:00:00 R checkpt
135197.philip1            ...4Vx_step-2-6k sbajga2        00:00:00 R single
135220.philip1            gb_s3_29.615p    ghoshbd        00:00:00 R single
135229.philip1            STDIN            abdik          180:12:3 R workq
135231.philip1            gb_s4_25.025s7n  ghoshbd        00:00:00 R single
135232.philip1            gb_s4_43.04s0    ghoshbd        00:00:00 R single
135289.philip1            GRRMxx           wairimu        221:13:0 R workq
135297.philip1            ABC1             ritt           29:52:21 R single
135298.philip1            ABC2             ritt           29:53:10 R single
135347.philip1            Ba1.3k6step3     sbajga2               0 Q single
135352.philip1            STDIN            qsheng1        128:51:0 R single
135361.philip1            1Dnet3no         qsheng1        49:33:02 R single
135363.philip1            M1DnetDre        qsheng1               0 Q single
135369.philip1            visit_python     lbutler               0 R priority
[lbutler@philip1 ~]$
```

qsub <batch script>
showstart <job_id>
qstat
qshow <job_id>
qdel <job_id>
showq

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(16)   Checking on the batch job.

qsub <batch script>
showstart <job_id>
qstat
qshow <job_id>
qdel <job_id>
showq

```
[lbutler@philip1 ~]$ qshow 135372
PBS job: 135372, nodes: 4
Hostname  Days Load CPU U# (User:Process:VirtualMemory:Memory:Hours)
philip018   77 7.93 796 17 lbutler:engine_par:267M:49M:0.0 lbutler:engine_par:1.8G:1.6G:0.0 lbutler:engine_par:267M:49M:0.0 lbutler:engine_par
:267M:49M:0.0 lbutler:engine_par:267M:49M:0.0 lbutler:engine_par:267M:49M:0.0 lbutler:engine_par:267M:49M:0.0 lbutler:engine_par:267M:49M:0.0
lbutler:pbs_demux:13M:1M lbutler:135372:63M:1M lbutler:cli:218M:12M lbutler:viewer:421M:46M lbutler:mdserver:320M:24M lbutler:mpirun:11M:1M lb
utler:hydra_pmi_proxy:11M:1M
philip019    77 0.06    0  1
philip020    77 0.00    0  1
philip021    77 0.00    0  1
```
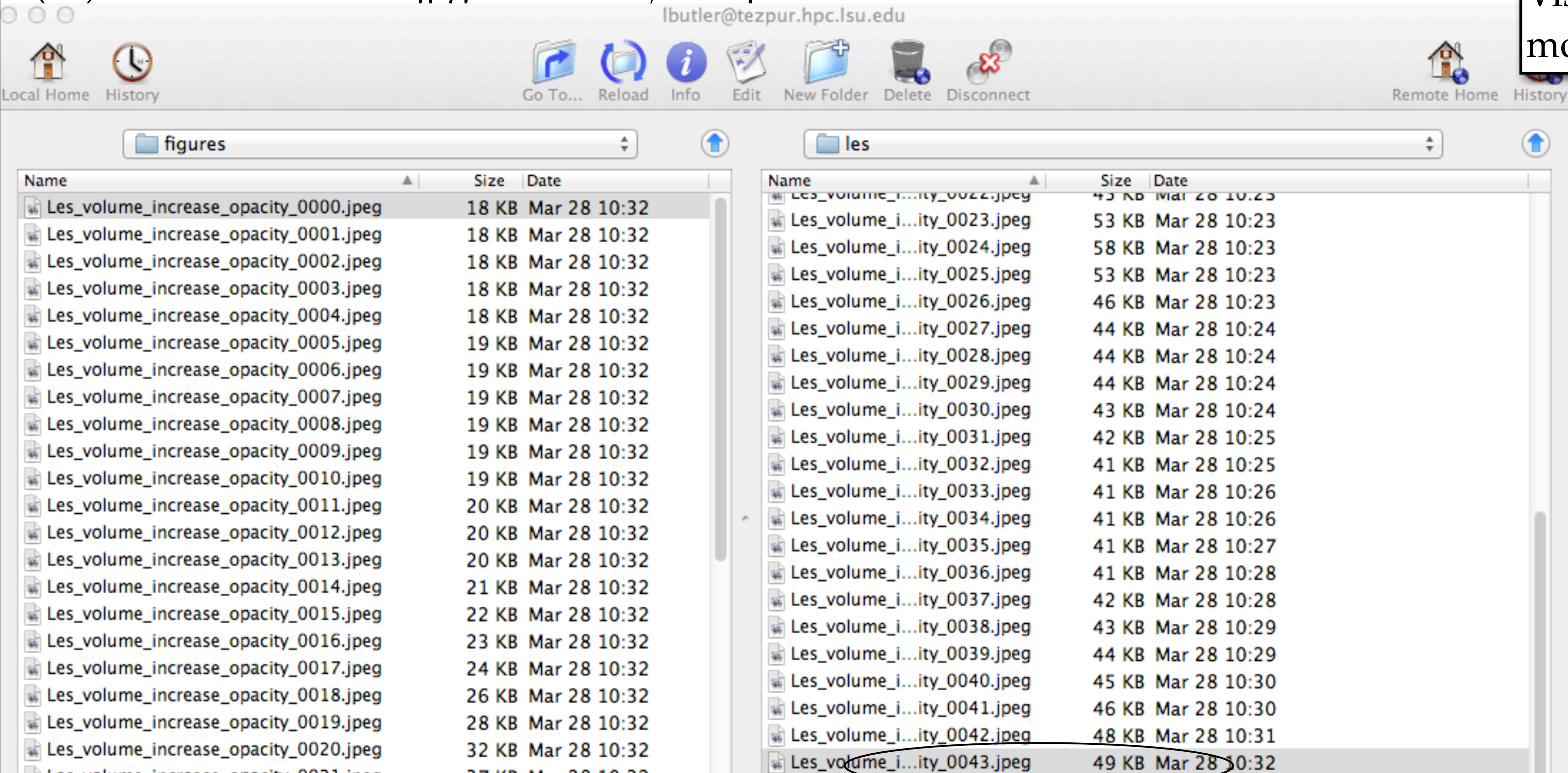
I'd like to get memory usage (GB used, GB available) but it's not easy to spot the relevant numbers.

(16)   I transfered the *.jpg back to my computer

VisIt batch mode

lbutler@tezpur.hpc.lsu.edu

Local Home   History   Go To...   Reload   Info   Edit   New Folder   Delete   Disconnect   Remote Home   History

figures

| Name | Size | Date |
|---|---|---|
| Les_volume_increase_opacity_0000.jpeg | 18 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0001.jpeg | 18 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0002.jpeg | 18 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0003.jpeg | 18 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0004.jpeg | 18 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0005.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0006.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0007.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0008.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0009.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0010.jpeg | 19 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0011.jpeg | 20 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0012.jpeg | 20 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0013.jpeg | 20 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0014.jpeg | 21 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0015.jpeg | 22 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0016.jpeg | 23 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0017.jpeg | 24 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0018.jpeg | 26 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0019.jpeg | 28 KB | Mar 28 10:32 |
| Les_volume_increase_opacity_0020.jpeg | 32 KB | Mar 28 10:32 |

les

| Name | Size | Date |
|---|---|---|
| Les_volume_i...ity_0022.jpeg | 43 KB | Mar 28 10:23 |
| Les_volume_i...ity_0023.jpeg | 53 KB | Mar 28 10:23 |
| Les_volume_i...ity_0024.jpeg | 58 KB | Mar 28 10:23 |
| Les_volume_i...ity_0025.jpeg | 53 KB | Mar 28 10:23 |
| Les_volume_i...ity_0026.jpeg | 46 KB | Mar 28 10:23 |
| Les_volume_i...ity_0027.jpeg | 44 KB | Mar 28 10:24 |
| Les_volume_i...ity_0028.jpeg | 44 KB | Mar 28 10:24 |
| Les_volume_i...ity_0029.jpeg | 44 KB | Mar 28 10:24 |
| Les_volume_i...ity_0030.jpeg | 43 KB | Mar 28 10:24 |
| Les_volume_i...ity_0031.jpeg | 42 KB | Mar 28 10:25 |
| Les_volume_i...ity_0032.jpeg | 41 KB | Mar 28 10:25 |
| Les_volume_i...ity_0033.jpeg | 41 KB | Mar 28 10:26 |
| Les_volume_i...ity_0034.jpeg | 41 KB | Mar 28 10:26 |
| Les_volume_i...ity_0035.jpeg | 41 KB | Mar 28 10:27 |
| Les_volume_i...ity_0036.jpeg | 41 KB | Mar 28 10:28 |
| Les_volume_i...ity_0037.jpeg | 42 KB | Mar 28 10:28 |
| Les_volume_i...ity_0038.jpeg | 43 KB | Mar 28 10:29 |
| Les_volume_i...ity_0039.jpeg | 44 KB | Mar 28 10:29 |
| Les_volume_i...ity_0040.jpeg | 45 KB | Mar 28 10:30 |
| Les_volume_i...ity_0041.jpeg | 46 KB | Mar 28 10:30 |
| Les_volume_i...ity_0042.jpeg | 48 KB | Mar 28 10:31 |
| Les_volume_i...ity_0043.jpeg | 49 KB | Mar 28 10:32 |

Only up to #43, and I was expecting 51.  Should have asked for more walltime.  Oh well.

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(16b)   Let's review the FileZilla, rm *, qsub procedure.

- in /projects/lbutler/students/les/   I delete all the *.jpg files with a command like
  $ rm *.jpeg

- I cd ~ back to my Philip home directory and qsub the batch script file

- I use FileZilla (or Fugu) to copy the *.jpg to my Macintosh for *.jpg to *.mov conversion

12

**(17)   Use any convenient program to turn \*.jpg sequence into movie.**

This movie made from 44 jpg images of size 600x600.

Average file size about 40 kb.   Images assembled into a movie with:

- QuickTime Pro v7  ($30
- GraphicConverter v6.6
- iMovie
- Mathematica (of course)
- Adobe Premier (on viz lab computers)

```
.resampleTarget = 50000000
.opacityMode = va.FreeformMode
tPlotOptions(va)

Draw the Plot
awPlots()

Set the plot orientation
 = GetView3D()
v0.viewNormal = (0.80, 0.5, -0.50)
SetView3D(v0)
# print v0
```

Recall this comment about the loop parameters:

range(255,5,-5)   yields 51 images

range(255,5,-10) yields 26 images ~10 minutes, 1 node

range(255,1,-1)   yields 254 images ~1:30, 1 node

```
# Loop over a range of opacity values and save the plots
for j in range(255,5,-5):
    ffo = range(0,256)
    for i in ffo:
        if i <= j:
            ffo[i] = 0
        else:
            ffo[i] = 255
    va.freeformOpacity = tuple(ffo)
    SetPlotOptions(va)
    DrawPlots()
    name = SaveWindow()
```

The movie as made with Mathematica.

Pgm8_JPG_to_Quicktime.nm

**(17)** Use any convenient program to turn *.jpg sequence into movie.

This movie made from 44 jpg images of size 600x600.

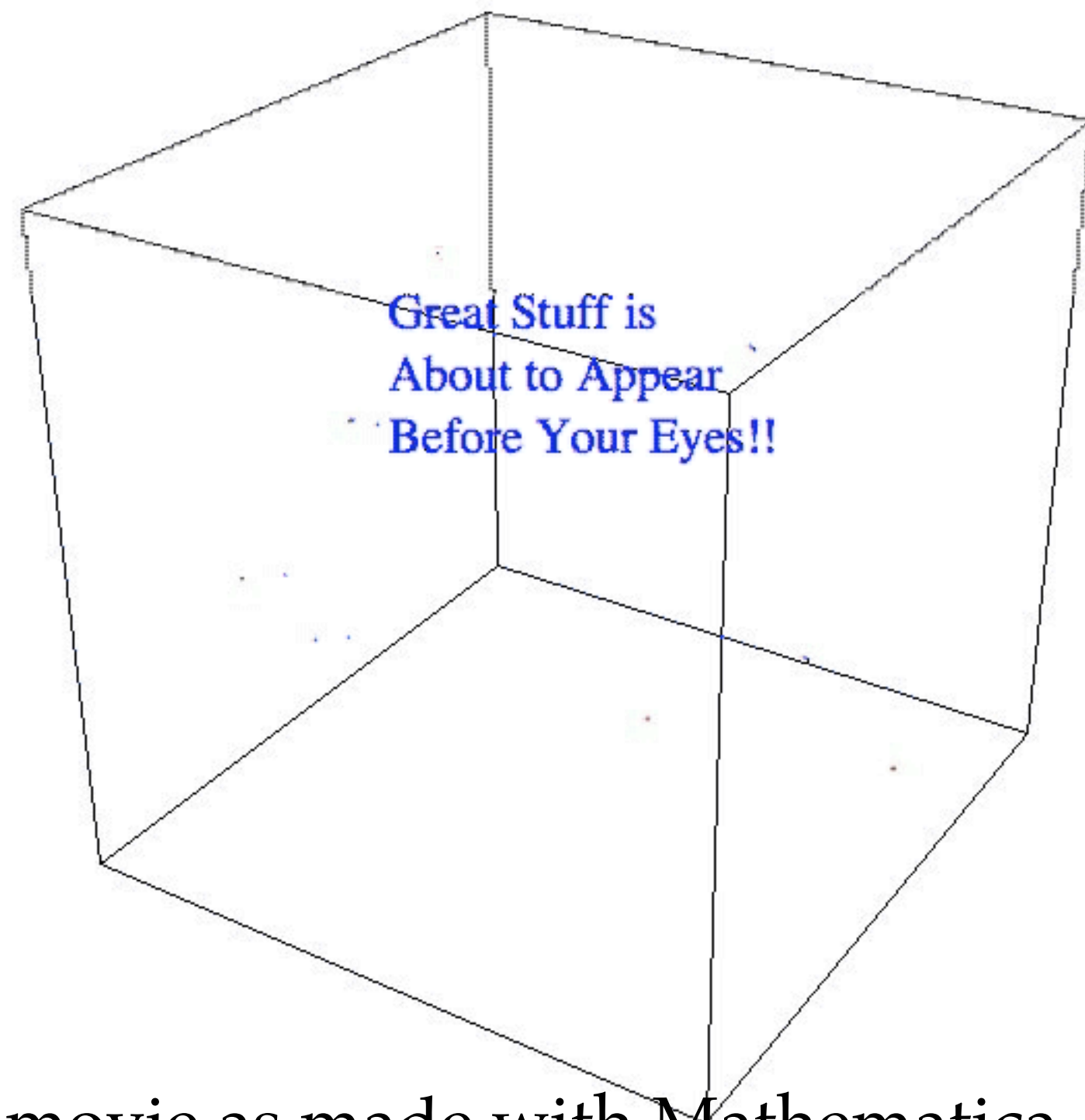Average file size about 40 kb.   Images assembled into a movie with:

- QuickTime Pro v7  ($30
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awPlots()

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 = GetView3D()
v0.viewNormal = (0.80, 0.5, -0.50)
SetView3D(v0)
# print v0
```



Great Stuff is About to Appear Before Your Eyes!!

Recall this comment about the loop parameters:

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        if i <= j:
            ffo[i] = 0
        else:
            ffo[i] = 255
    va.freeformOpacity = tuple(ffo)
    SetPlotOptions(va)
    DrawPlots()
    name = SaveWindow()
```

The movie as made with Mathematica.

Pgm8_JPG_to_Quicktime.nm

# Pgm12_JPG_to_QuickTime.nb

- Read the jpg images as a List.  As needed, Reverse the List
- Export the List at 5 frames per second and at 15 frames per second
- Export a tiny movie  (not working well)
- Export the original and the reversed lists
- Add a title and credits

- **Read the jpg images as a List.  As needed, Reverse the List**

```
71]:= pathJPG = NotebookDirectory[] <> "images/"

171]= /Volumes/Sab-Data-1/t4581/wk12/images/

72]:= filenamesJPG = FileNames["*.jpeg", pathJPG];

73]:= indexMax = 145;
      allImages = Table[ Import[filenamesJPG[[index]] ], {index, 9, indexMax}];

47]:= allImagesReversed = Reverse[allImages];
```

- **Export the List at 5 frame per second and at 15 frames per second**

```
148]:= Export[ NotebookDirectory[] <> "my_movie_5fps.mov", allImages, "FrameRate" → 5]

[148]= /Volumes/Sab-Data-1/t4581/wk12/my_movie_5fps.mov

179]:= Export[ NotebookDirectory[] <> "my_movie_15fps.mov", allImages, "FrameRate" → 15]

[179]= /Volumes/Sab-Data-1/t4581/wk12/my_movie_15fps.mov
```

- **Export the original and the reversed lists**

```
151]:= Export[ NotebookDirectory[] <> "my_movie_comes_and_goes.mov",
       Flatten[{allImages, allImagesReversed}], "FrameRate" → 15]

[151]= /Volumes/Sab-Data-1/t4581/wk12/my_movie_comes_and_goes.mov
```

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