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Chapter 1

Documentation

13.02.2012 Deleted some jobs I started yesterday because they had artificial crosses or were practically unconstrained
Third simulation `fuenfincr256_1` ran through - Galacticus restart worked well!
Note: IC with same seed but higher resolution do not yield the same simulation! *rightarrow* started two more test runs from r128 sims to doublecheck

12.02.2012 Updated Galacticus to revision 707 as suggested by Andrew and added parameter `hotHaloOutflowAngularMomentumAlwaysGrows` to xml file.
Two of four simulations ran through (copied hdf5 to transfer), two crashed *rightarrow* try to continue at saved states!

10.02.2012 wrote E-Mail to Andrew about performance problems and wavelenght computation error in `fuenfincr256_1`
started some runs with higher central delta and broader smoothing lenghts, i.e. 32/dx and 100/dx; all 128 resolution except second last one (same seed!):

83492	0.60500	d31c_1_st	harre	r	02/10/2012	15:19:56	intel.q@astro18	16
83493	0.60500	d31c_2_st	harre	r	02/10/2012	15:20:37	intel.q@astro29	16
83494	0.60500	d31c_3_st	harre	r	02/10/2012	15:21:17	intel.q@astro25	16
83495	0.60500	d51c_s1100	harre	r	02/10/2012	15:23:21	intel.q@astro31	16
83496	0.54786	d3+3c_s150	harre	r	02/10/2012	15:37:13	intel.q@astro12	16
83497	0.60500	d3+3c_s150	harre	r	02/10/2012	15:39:16	intel.q@astro30	32
83498	0.60500	d15+3c_s15	harre	r	02/10/2012	15:44:23	intel.q@astro30	16

09.02.2012 `drd5_r256` last written to hdf5 file feb 09, 05:07
`fuenfincr256_2` last written to hdf5 file feb 06, 03:28
`drd5_r256_2` last written to hdf5 file feb 07, 00:50

- 02.02.2012 drdx_h100_128_1 run has again severe consistency metric problem
→ not clear why
upper python script does not work, was commented out again
plan: **move to python scripts in general in order to have easier arithmetic calculations**
plan: create new folder structure and remove old simulations → done
- 31.01.2012 note: h=70.3 in galacticus xml input file is expected, consistent tree obviously implies it
→ fixed: changed in markus parameter file for the converter and in xml file
→ question: why not read out?
→ python updateGalacticusStart.py from Markus
- 30.01.2012 new consistenttree with vmax=20

Chapter 2

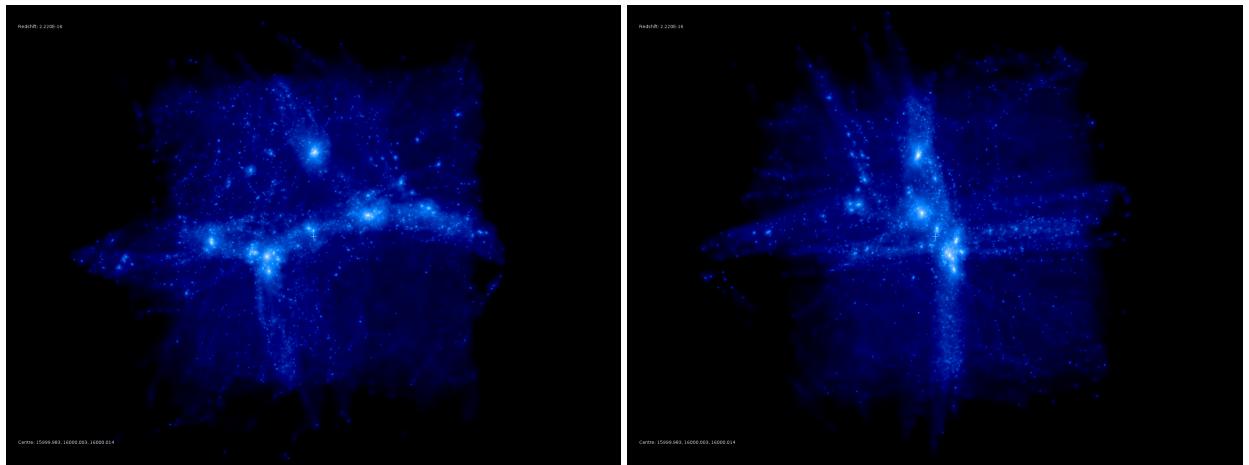
Simulations

2.1 r128

2.1.1 h70

2.1.2 h100

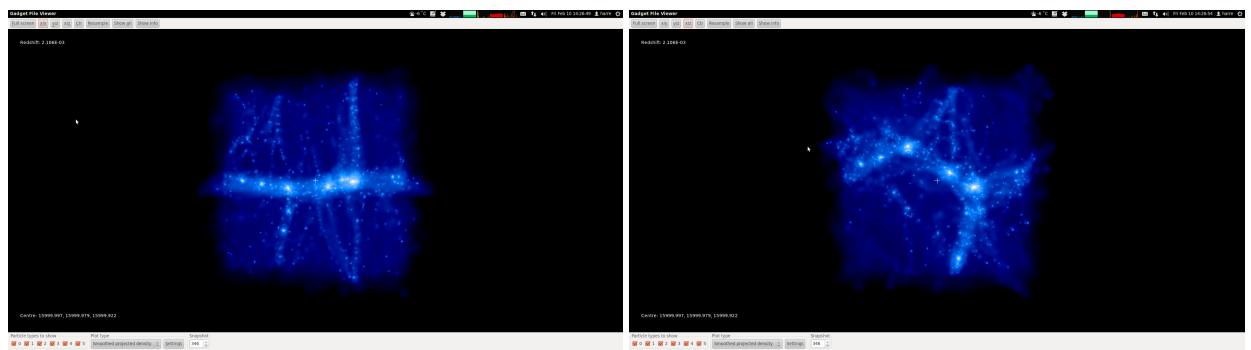
drdx_3



ROCKSTARRED ✓

pfff → Error: too few halos at scale factor 0.926072 to calculate consistency metric.

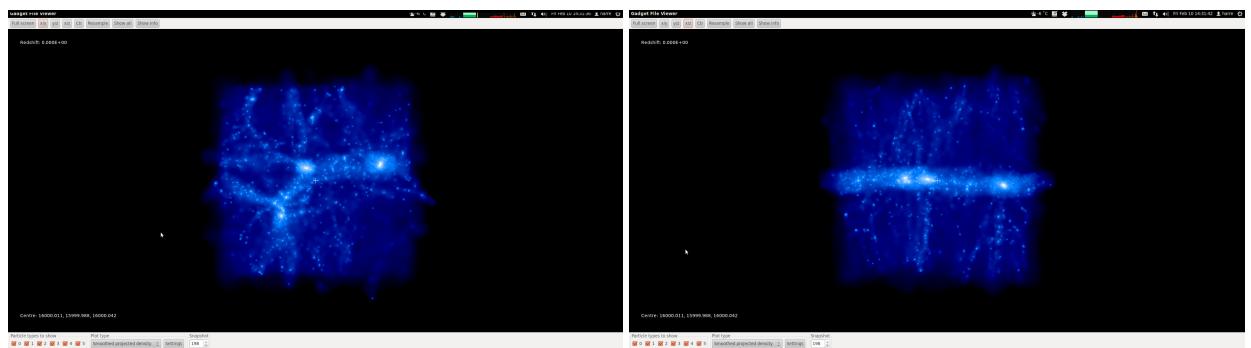
drdx_h100_r128_1



ROCKSTARRED ✓

consistenttree: too few halos at scale factor 0.896 ... → wtf?

drdx_h100_r128_2



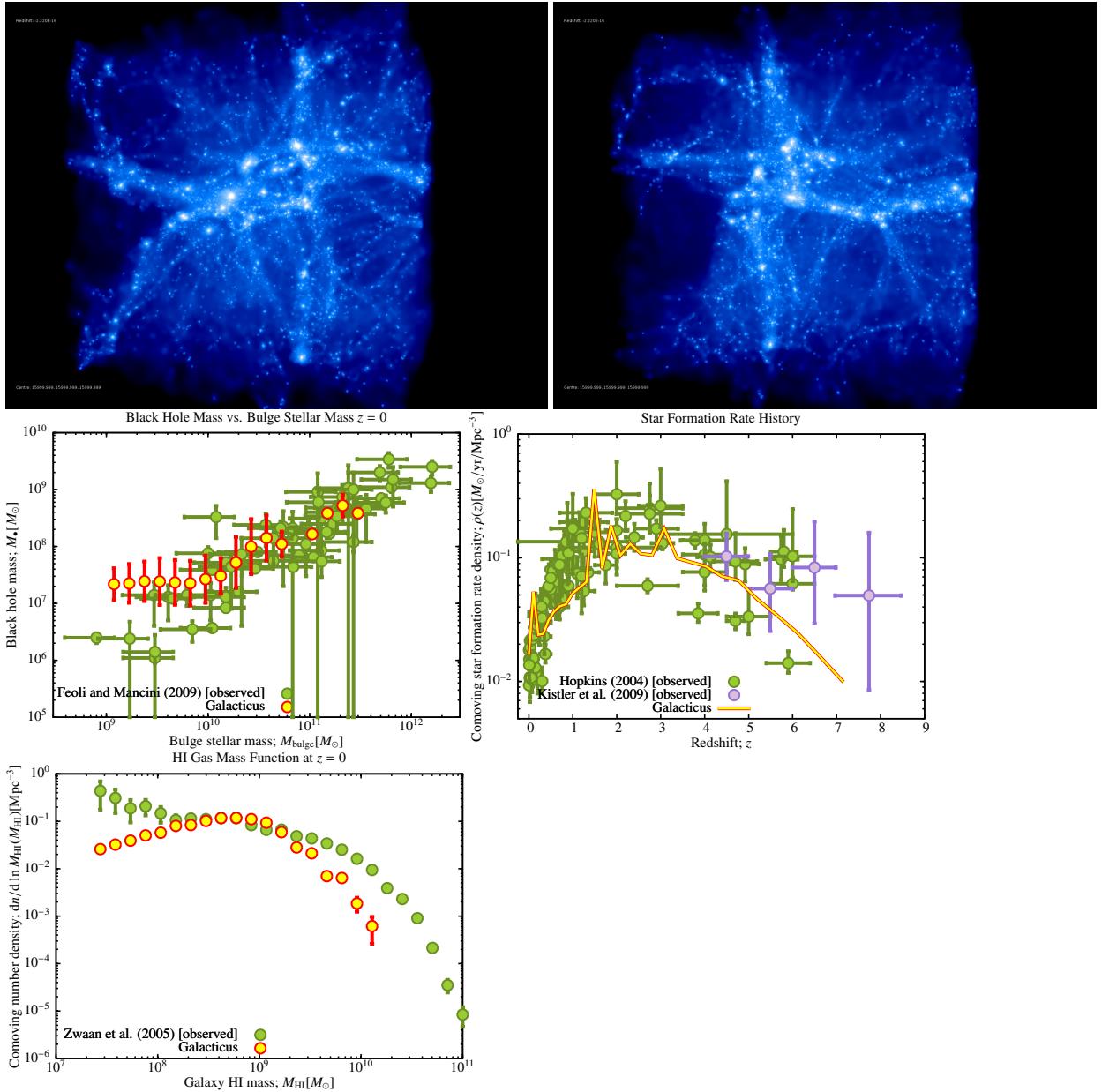
is being rockstarred

2.2 r256

2.2.1 h70

2.2.2 h100

`drd5_r256 (+)`



ROCKSTARRED ✓

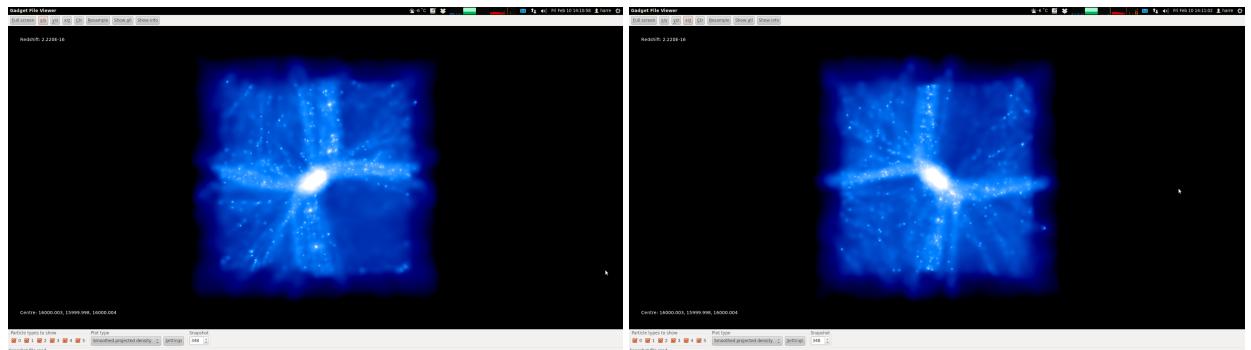
CONSISTENTTREED ✓

GALACTICUS:

```
Fatal error in Build_Descendent\_Pointers():
failed to find descendent node: 5546454 of 5522259
galacticus.sh: line 67: 25689 Aborted
```

tree copied to markus transfer
→ re-converted with bugfixed converter
galacticus running on SGE
GALACTICUSSED ✓

drd5_r256_2 → dump!



ROCKSTARRED ✓ (lasted about 9000minutes)

CONSISTENTTREE ✓

is being galacticussed → job seems to run!

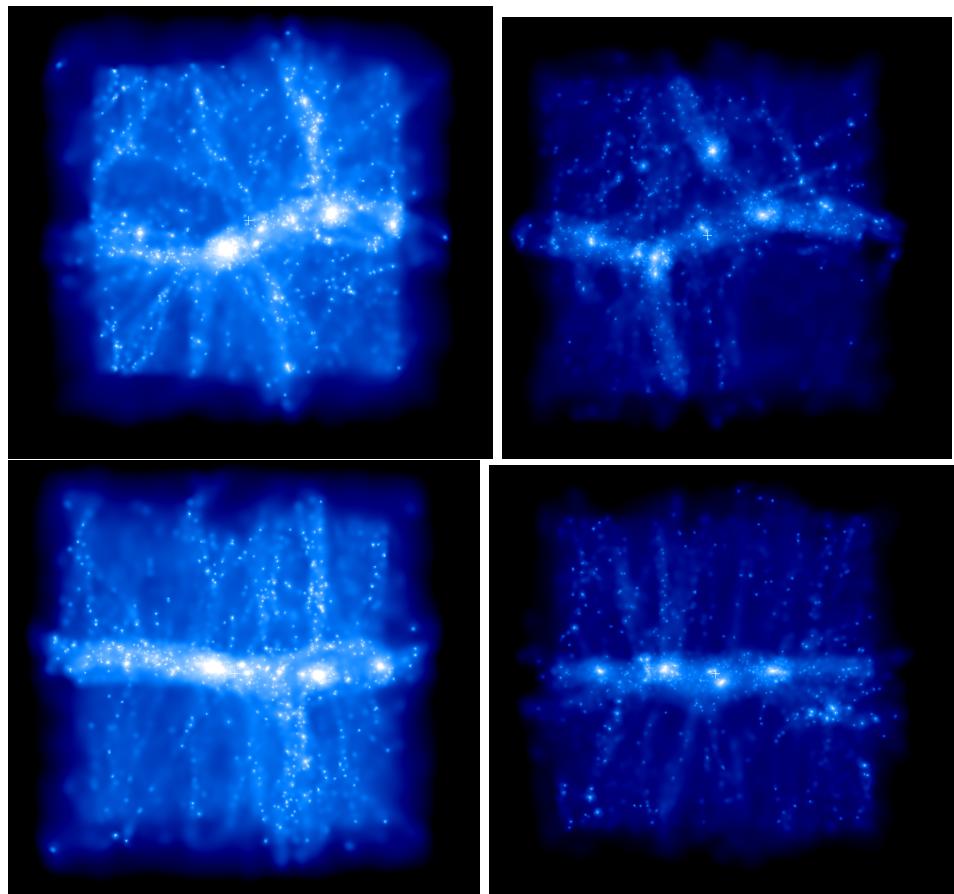
no: A fatal error occurred! Backtrace for this error:

```
#0 0x2B3F2E65E897
#1 0x2B3F2E65EE4E
#2 0x301763648F
#3 0x487AA0 in __merger_tree_read_MOD_build_descendent_pointers
#4 0x48ADC3 in __merger_tree_read_MOD_merger_tree_read_do
#5 0x48205E in __merger_tree_construction_MOD_merger_tree_create
#6 0x46F469 in __galacticus_tasks_evolve_tree_MOD_galacticus_task_evolve_tree._omp_
.F90:0
#7 0x46F9C4 in __galacticus_tasks_evolve_tree_MOD_galacticus_task_evolve_tree
#8 0x46FA4F in __galacticus_tasks_MOD_galacticus_task_do
#9 0x4600E4 in MAIN__ at Galacticus.F90:0
```

→ re-converted with bugfixed converter (v0.3)

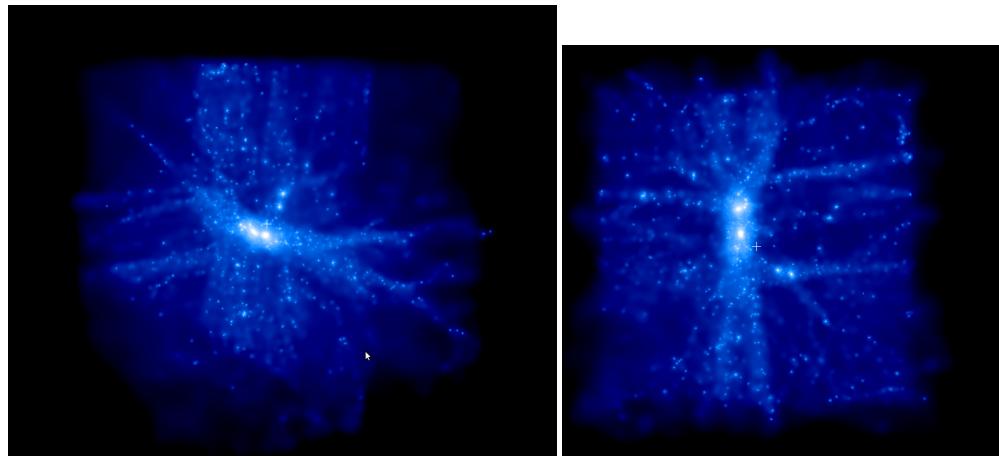
galacticus running on SGE

→ gadgetviewer: simulation has "artificial" cross → DUMP IT ?

drdx_3_r256

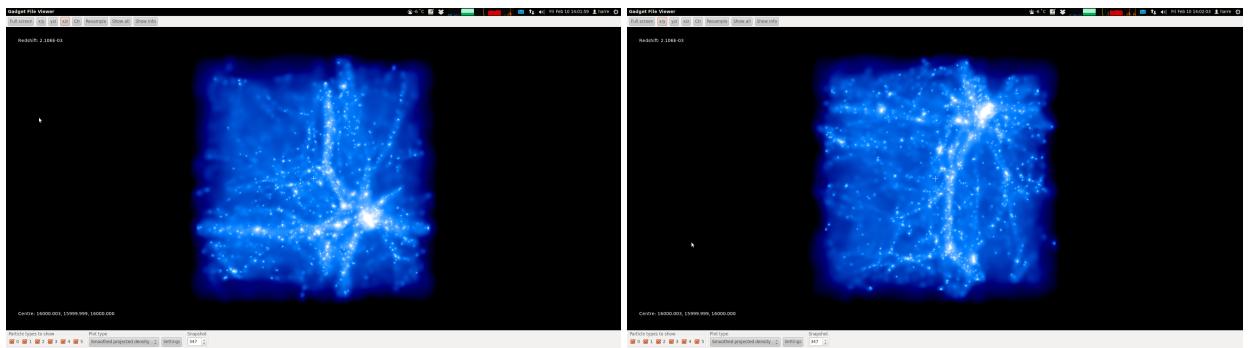
This run is a test if r256 and r128 (`drdx_3`) are comparable → see pictures.

drkltest+3c+sl50_1



is being rockstarred on astro-x4600-04

fuenfincr256_1



ROCKSTARRED ✓

CONSISTENTTREEDE ✓

GALACTICUS:

```
Fatal error in Build_Descendent_Pointers():
failed to find descendent node: 12048576 of 12014628
galacticus.sh: line 67: 5751 Aborted
```

tree copied to markus transfer

→ re-converted with bugfixed converter

Running model.....

Reading data for metallicity log10(Z/Z_Solar) = 0.198

Found 188 ages in the file

Found 1963 wavelengths in the file

gsl: ../../../../../roots/brent.c:57: ERROR: function value is not finite

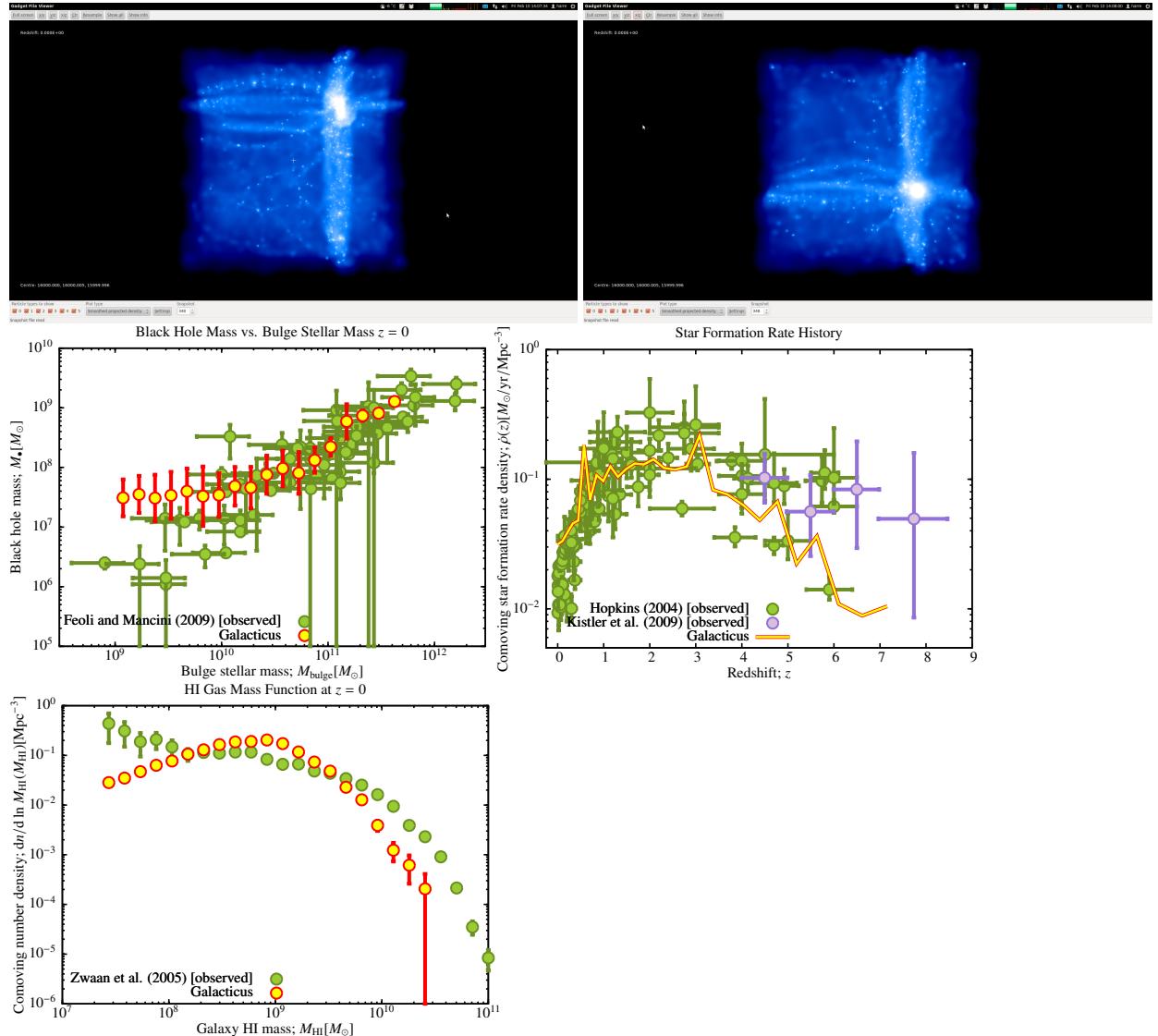
Default GSL error handler invoked.

→ E-Mail to Andrew

GALACTICUSSED ✓ BUT:

```
[3:46:48 PM CEST] Markus Haider: der fuenfincr256_1 hat a problem
[3:46:52 PM CEST] Markus Haider: der hat keine output gruppe
[3:46:58 PM CEST] Markus Haider: also keinen output
[3:47:30 PM CEST] Markus Haider: btw schon einen output
[3:47:34 PM CEST] Markus Haider: aber es scheint was zu fehlen
```

fuenfincr256_2 → dump!



ROCKSTARRED ✓ (lasted about 9000minutes)

CONSISTENTTREED ✓

is being galacticussed → job seems to run!

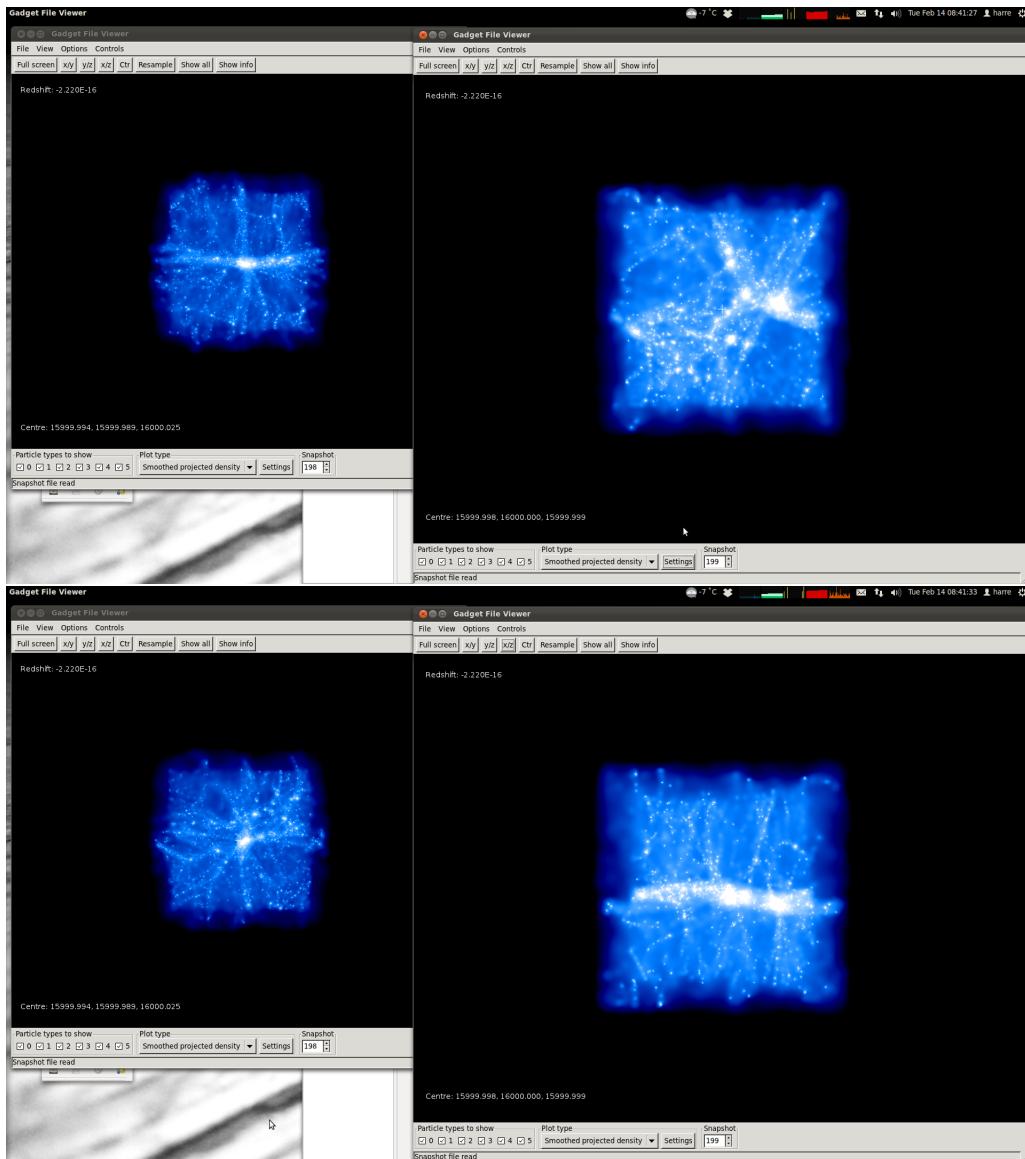
GALACTICUS:

```
Fatal error in Build_Descendent_Pointers():
failed to find descendent node
```

→ re-converted with bugfixed converter (v0.3)

galacticus running on SGE → gadgetviewer: simulation has "artificial" cross on right upper corner → DUMP IT ?

GALACTICUSSED ✓

gendrkl1r2_1c_1

This run is a test if r256 and r128 (**gendrkl1c_1**) are comparable → see pictures. Sims are not only different in resolution!

```
$ diff drkt+3c+s15_1+r2/constraints_drkt+3c+s15_1+r2.f
r128/h100/gendrkl1_1c_1/constraints_gendrkl1_1c_1.f

$ diff gendrkl1r2_1c_1/grafic_inc_gendrkl1r2_1c_1.f
r128/h100/gendrkl1_1c_1/grafic_inc_gendrkl1_1c_1.f
5c5
< parameter (np1=256,np2=256,np3=256,ncon=1)
```

```

---
> parameter (np1=128,np2=128,np3=128,ncon=1)

$diff drkt+3c+s15_1+r2/graficI0_drkt+3c+s15_1+r2.out
r128/h100/gendrk11_1c_1/graficI0_gendrk11_1c_1.out
23c23
< Particle lattice size: np1,np2,np3=           256           256           256
---
> Particle lattice size: np1,np2,np3=           128           128           128
25,27c25,27
< chosen: 0.12500000 0.0000000 5.00000007E-02
< npart, L_x, L_y, L_z= 16777216 32.00 32.00 32.00 Mpc
< Particle mass=.1447E+09 solar masses
---
> chosen: 0.25000000 0.0000000 5.00000007E-02
> npart, L_x, L_y, L_z= 2097152 32.00 32.00 32.00 Mpc
> Particle mass=.1158E+10 solar masses
29c29
< chosen: 661410019
---
> chosen: 110011410
37c37
< ak,akmax= 16.100662 16.000005475554534
---
> ak,akmax= 16.068306 16.000005475554534
40,41c40,41
< Mean sigma_delta, sigma_psi= 4.8100653 4.7177238 Mpc
< Chisq, dof, nu= 16779066. 16777215 0.31968603
---
> Mean sigma_delta, sigma_psi= 4.1531582 4.7162638 Mpc
> Chisq, dof, nu= 2095840.0 2097151 -0.64012647
43,45c43
< Constraint 1: Sampled, desired=-0.18943709E-02 0.25000000E-01
< Constraint 2: Sampled, desired=-0.25784860E-02 0.25000000E-01
< Constraint 3: Sampled, desired=-0.32668673E-02 0.25000000E-01
---
> Constraint 1: Sampled, desired=-0.64672055E-02 0.25000000E-01
47,48c45,46
< Chi-square for the 3 constraints:
< Sampled, desired= 1.8661366 27.346775
---
> Chi-square for the 1 constraints:
> Sampled, desired= 1.1184790 16.713776
51,53c49

```

```
< Constraint 1: Final= 0.26051383E-01
< Constraint 2: Final= 0.26259070E-01
< Constraint 3: Final= 0.26464038E-01
---
> Constraint 1: Final= 0.25000002E-01
56,58c52,54
<     sigma_delta, sigma_psi=   4.9218068      7.0955100      Mpc
<     Chisq, dof=    167779068.      167777212
<     Maximum delta, displacement=  29.811523      16.539606      Mpc
---
>     sigma_delta, sigma_psi=   4.2376528      6.6093922      Mpc
>     Chisq, dof=    2095838.9      2097150
>     Maximum delta, displacement=  22.542503      14.168747      Mpc
60c56
< Scaling density and displacements to a=  2.54245773E-02
---
> Scaling density and displacements to a=  3.36233079E-02
62,63c58,59
< For a=astart: linear sigma, delmax=  0.16509746      1.0000000
< RMS, max. 3-D displacement=  0.23801233      0.55480576      Mpc
---
> For a=astart: linear sigma, delmax=  0.18798503      1.0000000
> RMS, max. 3-D displacement=  0.29319692      0.62853473      Mpc
```

redo the test!