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Chapter 1

Documentation

14.02.2012 Wrote E-Mail to Bertschinger.

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_sta	harre	r	02/10/2012	15:19:56	intel.q@astro18	16
83493	0.60500	d31c_2_sta	harre	r	02/10/2012	15:20:37	intel.q@astro29	16
83494	0.60500	d31c_3_sta	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

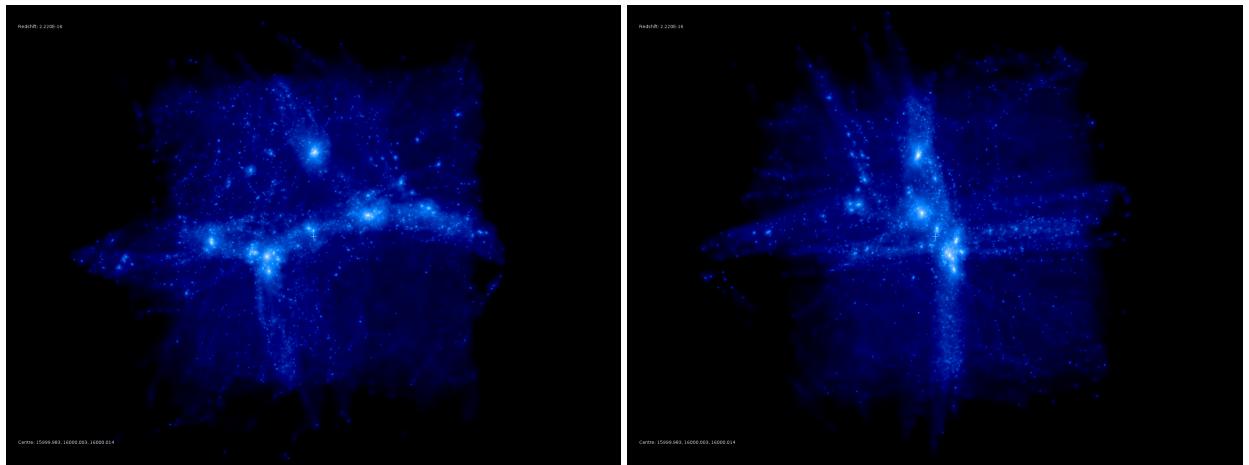
Simulations

2.1 r128

2.1.1 h70

2.1.2 h100

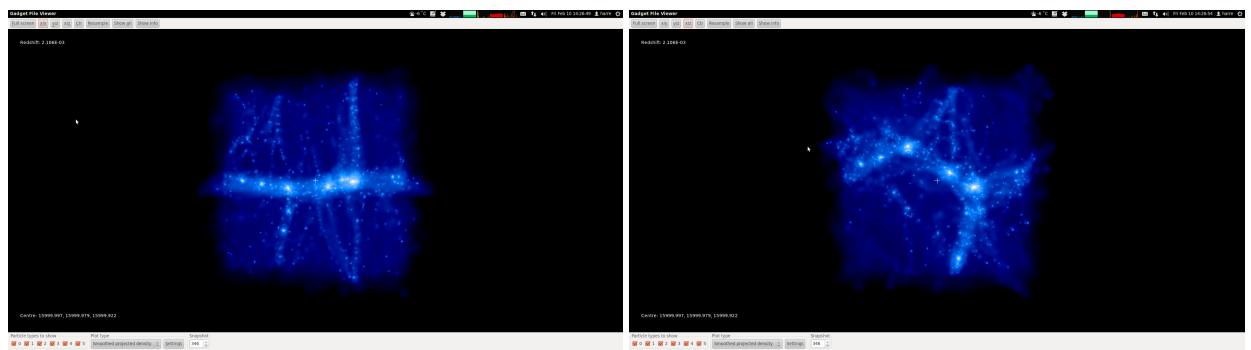
drdx_3



ROCKSTARRED ✓

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

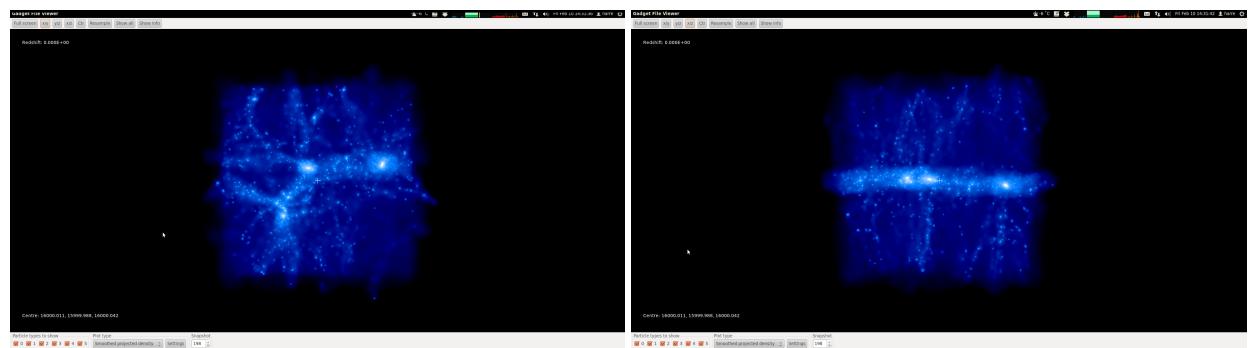
drdx_h100_r128_1



ROCKSTARRED ✓

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

drdx_h100_r128_2



is being rockstarred

drkltest+3c+sl50_1

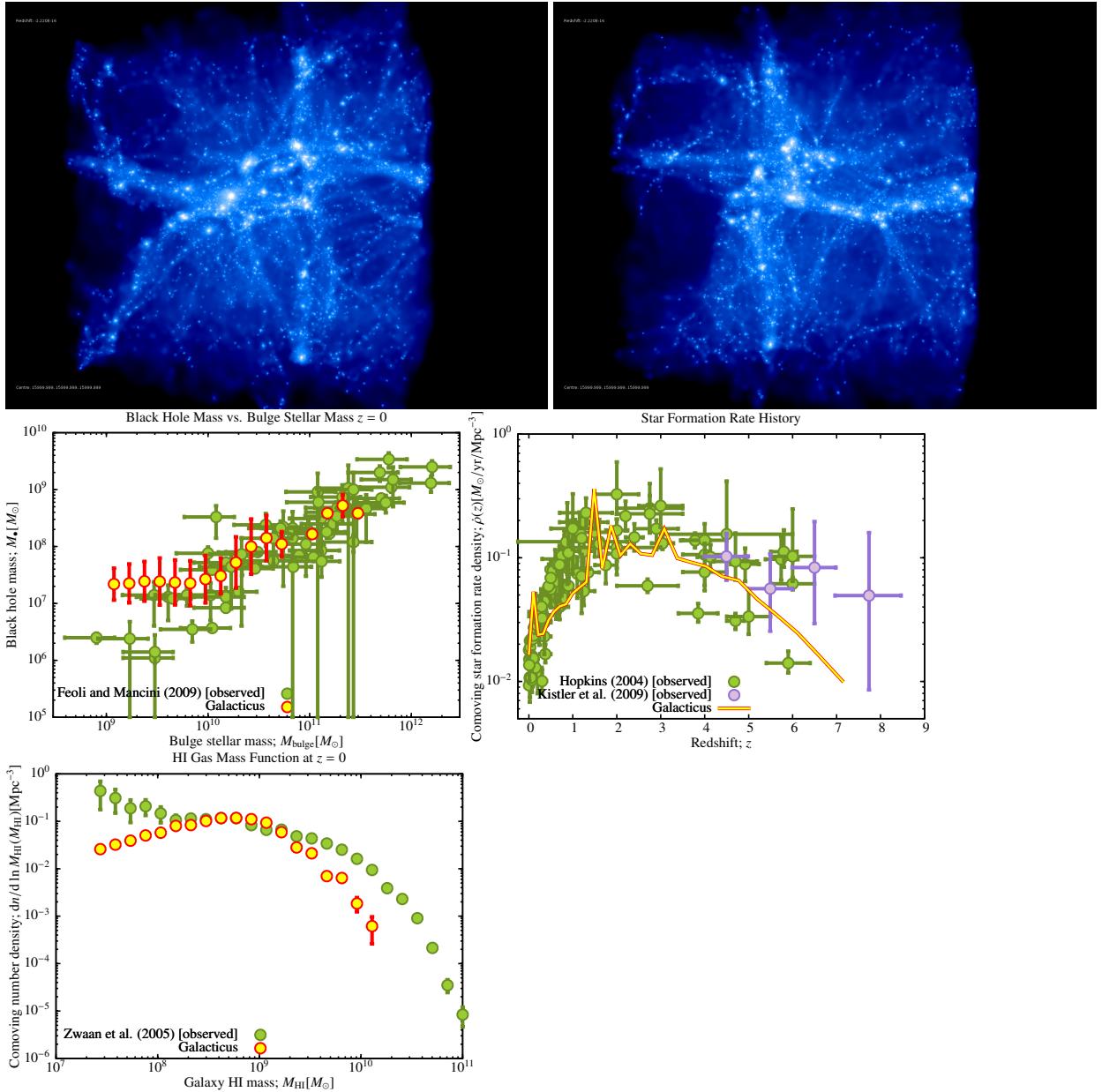
Error: too few halos at scale factor 0.890265 to calculate consistency metric.
Please remove this and all earlier timesteps from the scale file and rerun.
(DescScales.txt)

2.2 r256

2.2.1 h70

2.2.2 h100

`drd5_r256 (+)`



ROCKSTARRED ✓

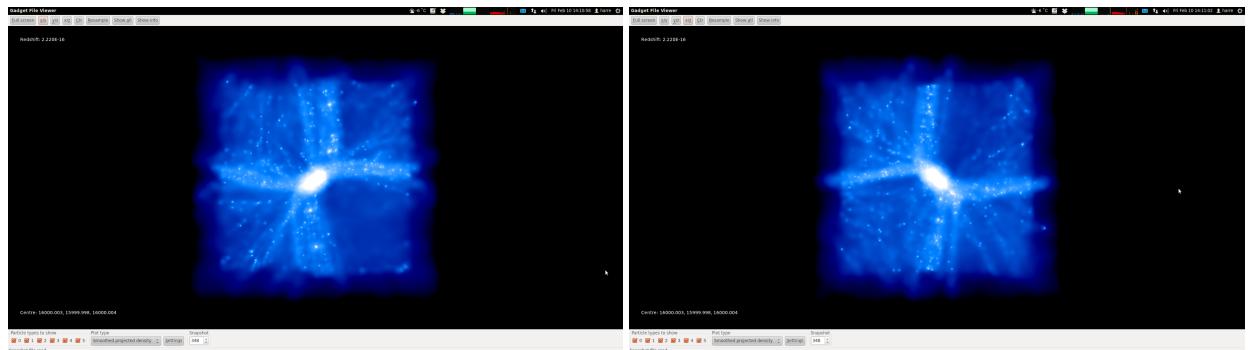
CONSISTENTTREED ✓

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!

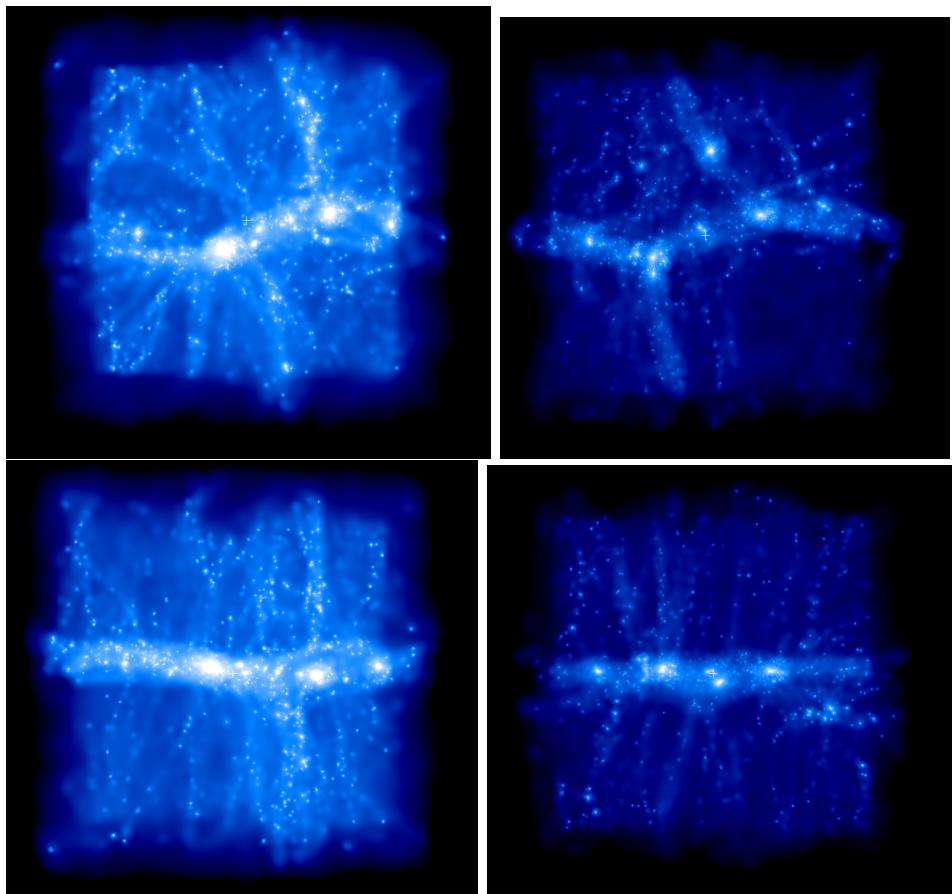
no: A fatal error occurred! Backtrace for this error:

```
#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)

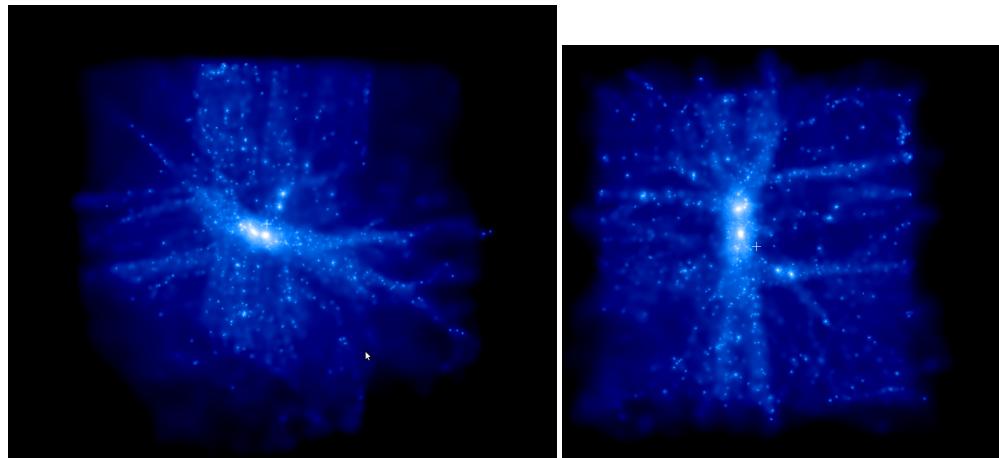
galacticus running on SGE

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

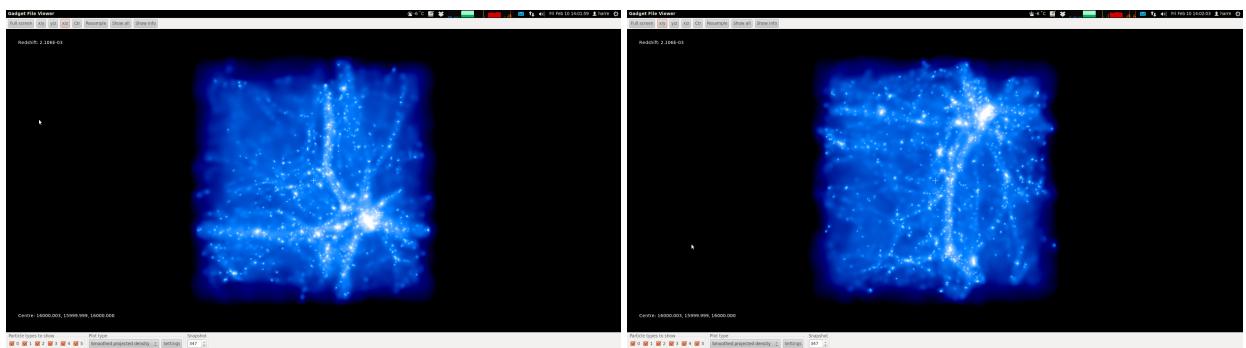
drdx_3_r256

This run is a test if r256 and r128 (drdx_3) are comparable → see pictures.
is being rockstarred on astro-x4600-03

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

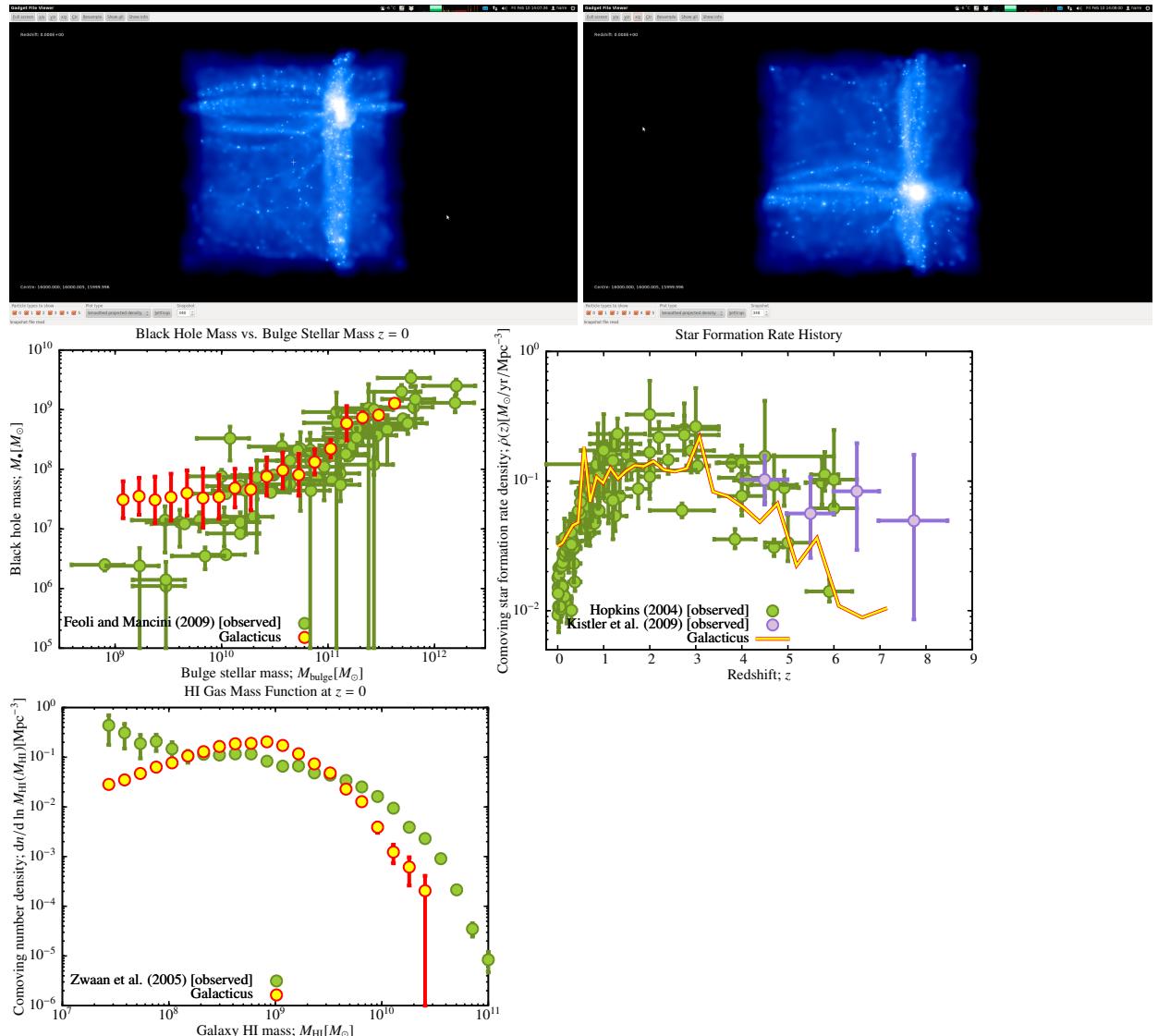
```
gsl: ../../../../../../roots/brent.c:57: ERROR: function value is not finite
Default GSL error handler invoked.
```

→ 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!

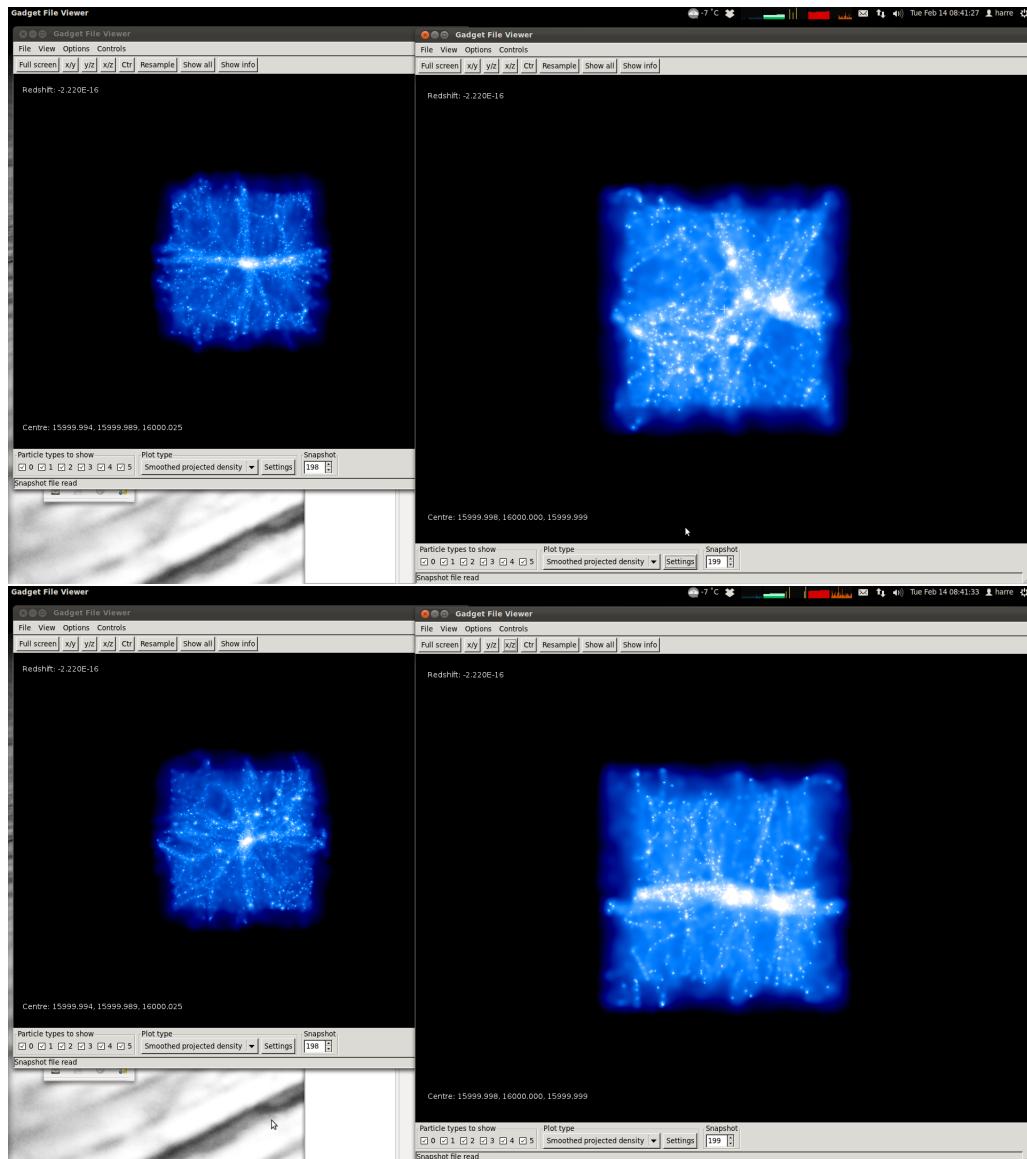
GALACTICUS:

```
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 gendrk1r2_1c_1/graficI0_gendrk1r2_1c_1.out r128/h100/gendrk11_1c_1/graficI0_8
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
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= 16781832. 16777215 0.79710007
---
> Mean sigma_delta, sigma_psi= 4.1531582 4.7162638 Mpc
> Chisq, dof, nu= 2095840.0 2097151 -0.64012647
43c43
< Constraint 1: Sampled, desired= 0.28453870E-02 0.25000000E-01
---
> Constraint 1: Sampled, desired=-0.64672055E-02 0.25000000E-01
46c46
< Sampled, desired= 0.21657717 16.718990
---
> Sampled, desired= 1.1184790 16.713776
49c49
< Constraint 1: Final= 0.25000000E-01
---
> Constraint 1: Final= 0.25000002E-01
52,54c52,54
< sigma_delta, sigma_psi= 4.9692168 7.6522889 Mpc
< Chisq, dof= 16781832. 16777214
< Maximum delta, displacement= 27.548712 17.026833 Mpc
---
> sigma_delta, sigma_psi= 4.2376528 6.6093922 Mpc

```

```
>      Chisq, dof= 2095838.9          2097150
>      Maximum delta, displacement= 22.542503          14.168747      Mpc
56c56
< Scaling density and displacements to a= 2.75129788E-02
---
> Scaling density and displacements to a= 3.36233079E-02
58,59c58,59
< For a=astart: linear sigma, delmax= 0.18037927          0.99999994
< RMS, max. 3-D displacement= 0.27777302          0.61806273      Mpc
---
> For a=astart: linear sigma, delmax= 0.18798503          1.0000000
> RMS, max. 3-D displacement= 0.29319692          0.62853473      Mpc
```

E-Mail sent to Bertschinger