

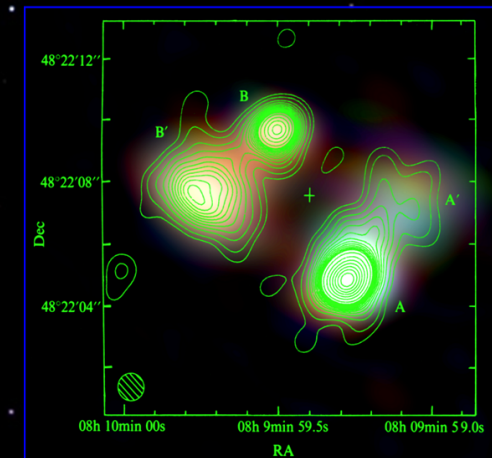
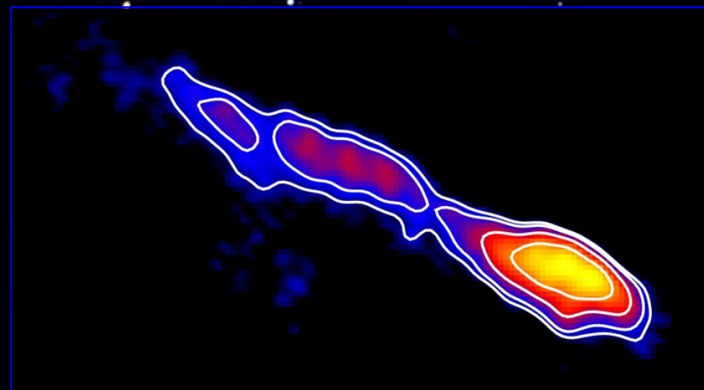
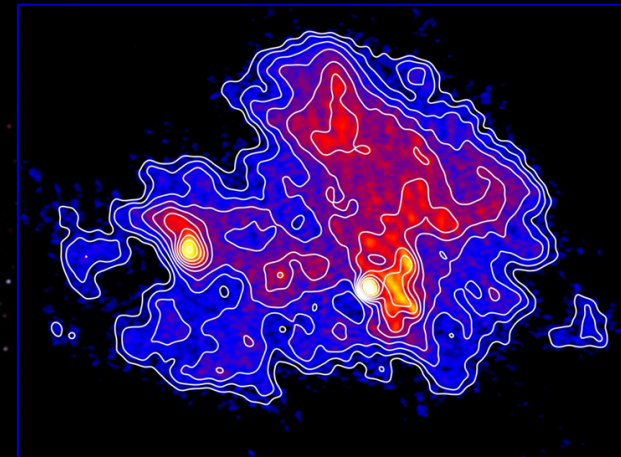
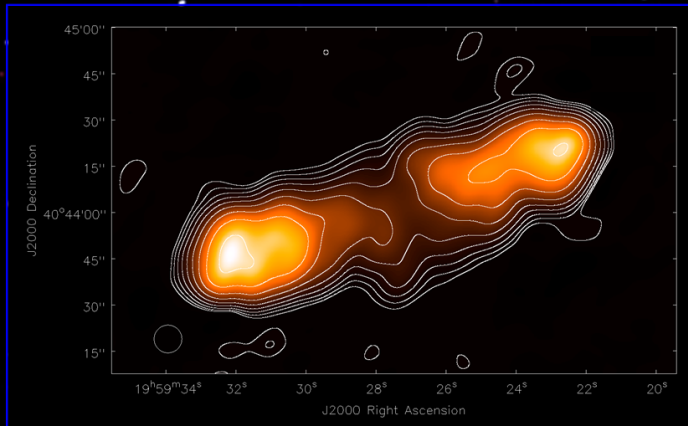
ASTRON



LOFAR

Netherlands Institute for Radio Astronomy

CEP3



July 10, 2013

CEP3: objectives

(Replacement for CEP1

(CEP1 hardware no longer supported & end of life

(Operational cost high (manpower & energy)

(Specification (budget constraints may impose deviations)

(5 Tflop/s CPU power

(Memory/core ratio > 3 Gbps

(Workspace/core ratio > 100 GB

(400 TB net storage (for data staging, not long term storage)

(40 Gbps storage – compute IO

(Ready for future developments

(GPU capability

(Adding/access to special nodes (e.g. more memory)

(Possibility for scaling up

(Batch scheduling for efficient resource usage

CEP3

Hooking on to RUG Millipede replacement



(**Current RUG Millipede** (Groningen University HPC cluster since 2010)

(**236 nodes with**

(12 Opteron 2.6 GHz cores

(24 GB memory

(**16 nodes with**

(24 Opteron 2.6 GHz cores

(128 GB memory

(**and 1 node with**

(64 cores

(512 GB memory

(**Network**

(Infiniband switch

(**Storage**

(110 TB

(**RUG Millipede replacement**

(Phase 1:

(After this Summer: ~ 64 servers added to existing HPC cluster

(Phase 2:

(End 2013/Early 2014: full replacement of existing hardware

(**Server hardware**

(16 core Intel CPU's

(64 GB

(2x 3TB internal disks

(Phase 1: ~ 16 fitted with NVIDIA Tesla K20M

(**Storage**

(Lustre

(~500 TB net storage

(~25 Gbps IO

CEP3

As a Millipede 'add-on'



(**Worker nodes**

- (Millipede nodes fulfil requirements
- (For CEP3 initially CPU-only nodes (...)
- (Option to share resources -> access to large & GPU capability Millipede queues

(**Storage**

- (Millipede Lustre storage has its benefits...
 - (HPC 'optimized' (balancing, all nodes share same storage, scalability, etc)
- (...and drawbacks
 - (Robust hardware architecture relatively expensive and limited IO
- (For CEP3 looking at alternatives
 - (e.g. inexpensive 'non-Lustre' storage or integrate storage with worker nodes

(**Possible Timeline**

- (Aim to decide on architecture/investment plan before August
- (Acquisition September
- (Available < 2014