Propaganda

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Posters

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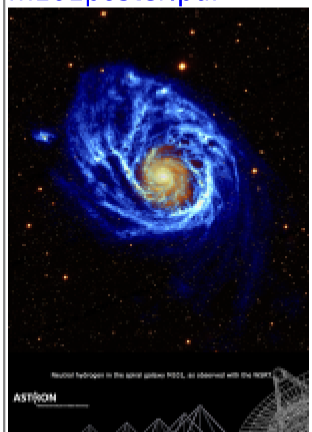
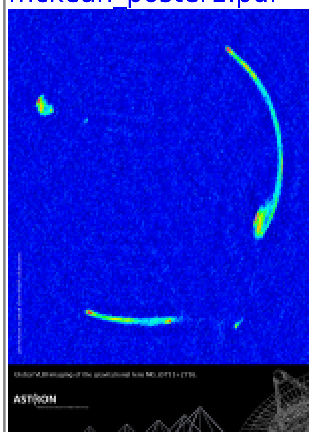
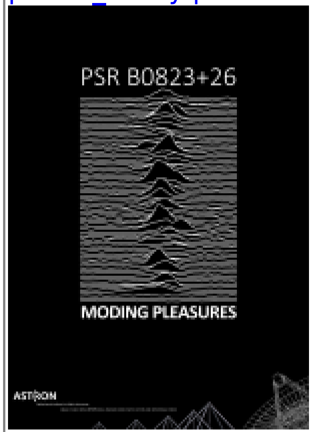
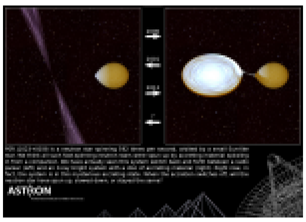
Title	**Author**	**Description (suitable for AJDI)**	**Link + Thumbnail**
M101	Tom Oosterloo	Neutral hydrogen in the spiral galaxy M101, observed with the WSRT.	m101poster.pdf 
Global VLBI imaging of the gravitational lens MG J0751+2716	John McKean	[Not ready for AJDI release] Gravitational lensing is the deflection of light from a distant background object (the source) by an intervening mass distribution (the lens). If the surface mass density of the lens is sufficiently high, then multiple images of the background source, which are often highly magnified and distorted, are produced. The gravitational lensing phenomena is beautifully illustrated in this global very long baseline interferometry image of MG J0751+2716 at redshift 3.2. Here, the extended background radio source is highly distorted into several images, some of which are stretched to form large gravitational arcs. Never before has such high angular resolution of extended arcs been seen before, which highlights the excellent sensitivity that can be achieved with VLBI arrays today (a collecting area that is about 10 per cent of the SKA).	mckean_poster1.pdf 

Title	**Author**	**Description (suitable for AJDI)**	**Link + Thumbnail**
PSR B0823+26: Emission modes in single pulses	Charlotte Sobey	NOTE: Would like to wait until paper published. PSR B0823+26 displays a plethora of magnetospheric emission characteristics over a wide range of timescales. Single-pulse data from the LOFAR (Low Frequency Array) telescope aided in the detection of a sporadic and weakly-emitting 'quiet' mode over hour-long periods, which displays rotating radio transient-like features with a nulling fraction forty-times greater than that during the more regularly-emitting 'bright' mode. Furthermore, the transition from the newly-discovered 'quiet' mode to the 'bright' mode occurs within one rotational period of the pulsar (0.5 s) and is concurrent across a broad range of radio frequencies. Studying such pulsars furthers insight into the relationship between the host of magnetospheric radio emission characteristics and understanding of the physical mechanism behind this. © C. Sobey; no connection with Joy Division, Peter Saville, et al.	poster_sobey.pdf 
PSR J1023+0038 transforming between a radio pulsar and an accreting system	Anne Archibald	[NOTE: the paper appears in print July 20th, possibly accompanied by a press release and video, so this might be a good time to post the image.] PSR J1023+0038 is a neutron star spinning 592 times per second, orbited by a small Sun-like star. We think all such fast-spinning neutron stars were spun up by accreting material spiraling in from a companion. We have actually seen this system switch back and forth between a radio pulsar (left) and an X-ray bright system with a disc of accreting material (right). Right now, in fact, the system is in this mysterious accreting state. When the accretion switches off, will the neutron star have spun up, slowed down, or stayed the same? © Anne Archibald, Joeri van Leeuwen	

archibald-poster-j1023.pdf



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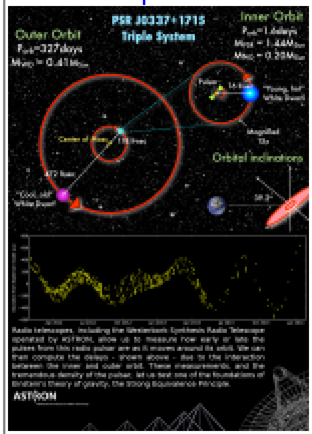
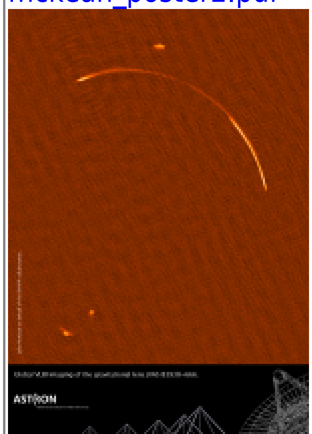
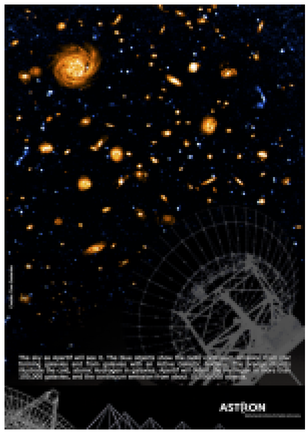
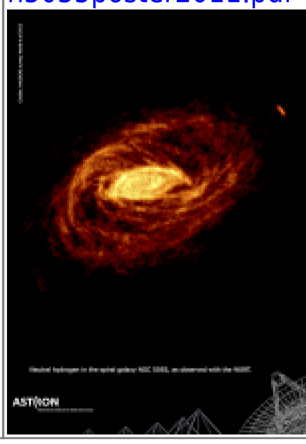
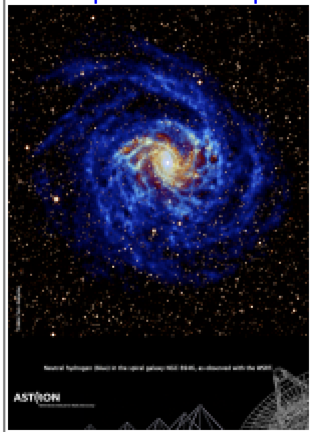
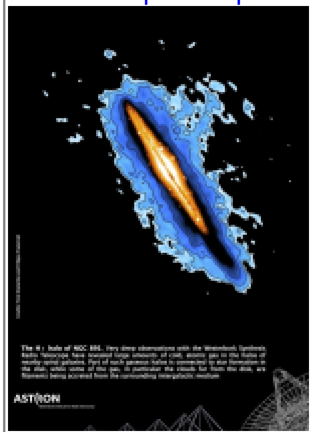
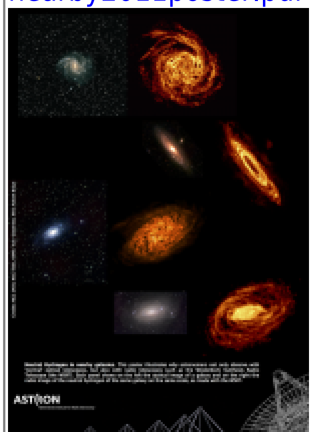
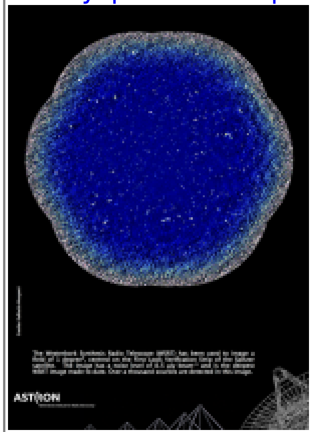
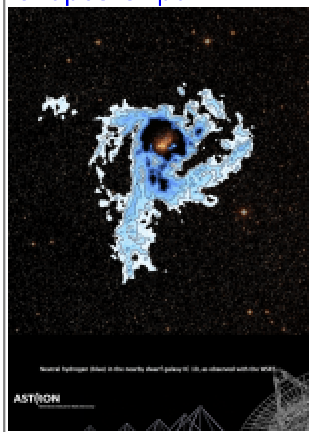
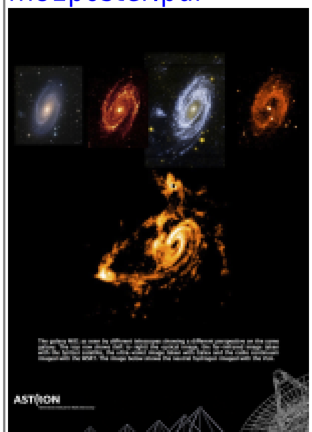
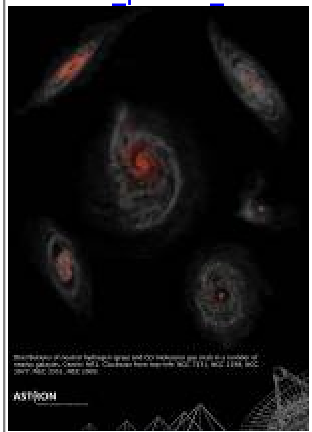
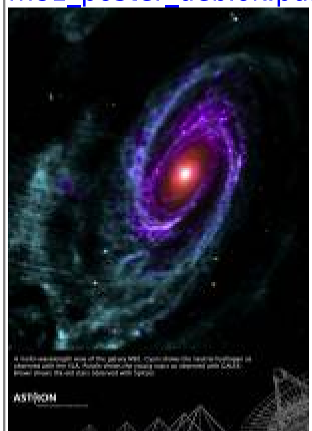
PSR J0337+1715: a millisecond pulsar in a stellar triple system	Anne Archibald	Radio telescopes, including the Westerbork Synthesis Radio Telescope operated by ASTRON, allow us to measure how early or late the pulses from this radio pulsar are as it moves around its orbit. We can then compute the delays - shown above - due to the interaction of the inner and outer orbit. These measurements, and the tremendous density of the pulsar, let us test one of the foundations of Einstein's theory of gravity, the Strong Equivalence Principle. © Jason Hessels, Anne Archibald	archibald-poster-0337-portrait.pdf 
Global VLBI imaging of the gravitational lens JVAS B1938+666	John McKean	[Not ready for AJDI release] Gravitational lensing is the deflection of light from a distant background object (the source) by an intervening mass distribution (the lens). If the surface mass density of the lens is sufficiently high, then multiple images of the background source, which are often highly magnified and distorted, are produced. The gravitational lensing phenomena is beautifully illustrated in this global very long baseline interferometry image of JVAS B1938+666 at redshift 2.0. Here, the extended background radio source is highly distorted into several images, some of which are stretched to form large gravitational arcs. Never before has such high angular resolution of extended arcs been seen before, which highlights the excellent sensitivity that can be achieved with VLBI arrays today (a collecting area that is about 10 per cent of the SKA).	mckean_poster2.pdf 

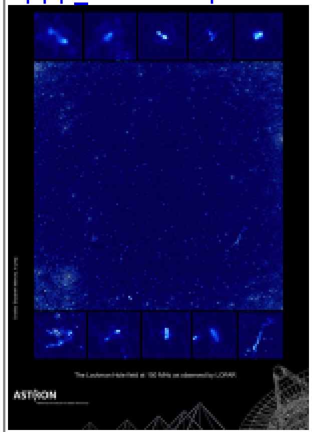
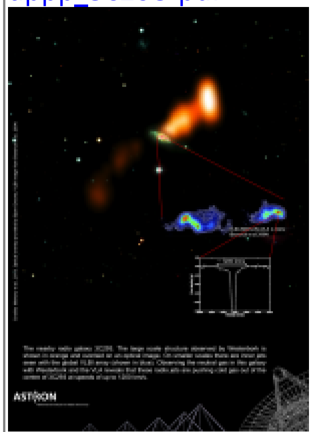
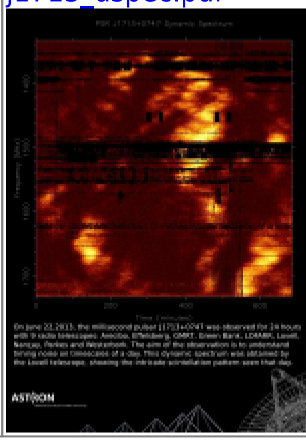
Apertif	Tom Oosterloo	The sky as Apertif will see it. The blue objects show the radio continuum emission from star forming galaxies and from galaxies with an Active Galactic Nucleus. The orange objects illustrate the cold, atomic Hydrogen in galaxies. Apertif will detect the Hydrogen in more than 100,000 galaxies, and the continuum emission from about 10,000,000 objects	apertif.pdf 
Dwingeloo 1 & 2	Tom Oosterloo	Dwingeloo 1 and 2 were discovered with the Dwingeloo dish in 1994 as part of a search for galaxies that are hidden by dust clouds in the plane of the Milky Way. Such dust clouds block the optical light of galaxies, but are transparent for their radio emission. Therefore, surveying the plane of the Milky Way with radio telescopes can reveal galaxies that are otherwise hard to see. In optical light, Dwingeloo 1 and 2 are almost invisible, but they have bright radio emission. The picture shows the radio image of Dwingeloo 1 and 2 made with the Westerbork Synthesis Radio Telescope	dwloo12poster-2.pdf 
NGC 5055	Tom Oosterloo/George Heald	Neutral hydrogen in the spiral galaxy NGC 5055, observed with the WSRT by the Halogas project.	n5055poster2011.pdf 

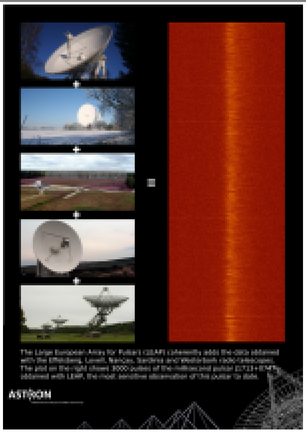
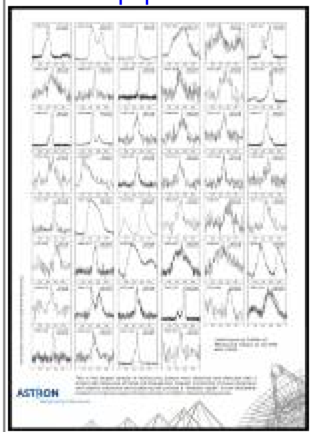
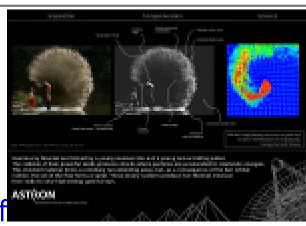
NGC 6946	Tom Oosterloo	Neutral hydrogen in the spiral galaxy NGC 6946, as observed with the WSRT.	n6946poster2011.pdf 
NGC 891	Tom Oosterloo	The HI halo of NGC 891. Very deep observations with the Westerbork Synthesis Radio Telescope have revealed large amounts of cold, atomic gas in the halos of nearby spiral galaxies. Part of such gaseous halos is connected to star formation in the disk, while some of the gas, in particular the clouds far from the disk, are filaments being accreted from the surrounding intergalactic medium	n8912011poster.pdf 
Nearby galaxies	Tom Oosterloo	Neutral Hydrogen in nearby galaxies. This poster illustrates why astronomers not only observe with 'normal' optical telescopes, but also with radio telescopes such as the Westerbork Synthesis Radio Telescope (the WSRT). Each panel shows on the left the optical image of a galaxy and on the right the radio image of the neutral hydrogen of the same galaxy on the same scale, as made with the WSRT.	nearby2011poster.pdf 

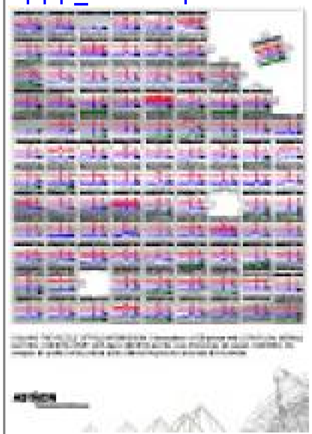
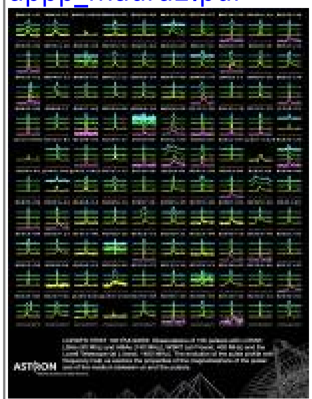
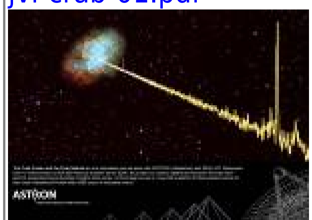
Surveys	Raffaella Morganti	The Westerbork Synthesis Radio Telescope (WSRT) has been used to image a field of 1 degree2, centred on the First Look Verification Strip of the Spitzer satellite. The image has a noise level of 8.5 μJy beam-1 and is the deepest WSRT image made to date. Over a thousand sources are detected in this image.	surveysposter2011.pdf 
IC10	Tom Oosterloo	Neutral hydrogen (blue) in the nearby dwarf galaxy IC 10, as observed with the WSRT	ic10poster.pdf 
M81	Tom Oosterloo	The galaxy M81 as seen by different telescopes showing a different perspective on the same galaxy. The top row shows (left to right) the optical image, the far-infrared image taken with the Spitzer satellite, the ultra-violet image taken with Galex and the radio continuum imaged with the WSRT. The image below shows the neutral hydrogen imaged with the VLA.	m81poster.pdf 

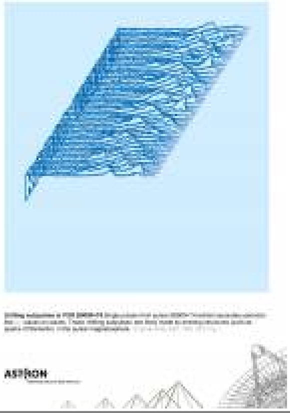
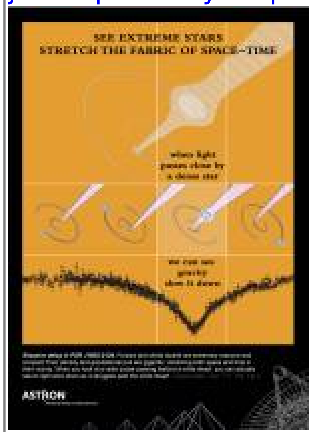
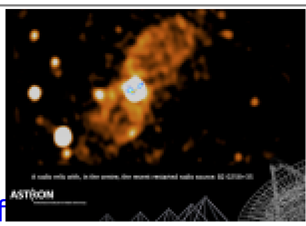
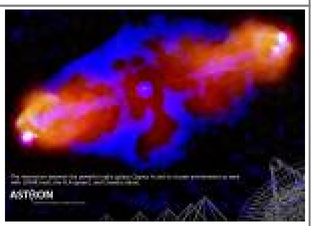
Leo P	Betsey Adams	HST data is unpublished and the work of a collaborator. An AJDI (with longer write-up) will be submitted when paper is published - do NOT place in queue until then. Caption: Leo P is an extreme star forming galaxy discovered via its neutral hydrogen content in the ALFALFA HI survey. Leo P is among the most metal poor galaxies known and relatively nearby, allowing in depth studies of the star formation process in pristine material. Deep observations with the Hubble Space Telescope resolve the population into individual stars. These observations will allow us to constrain both the star formation and the chemical evolution history of Leo P. Image credit: K. McQuinn (Minnesota Institute for Astrophysics)	poster_leop.pdf 
AGC198606	Betsey Adams	Paper in progress; AJDI will be submitted when paper is published. Caption: Neutral hydrogen contours of AGC198606 from observations with Westerbork are overplotted on deep optical data taken with ODI on the WIYN 3.5m telescope. Identified as a gas cloud in the ALFALFA HI Survey, AGC198606 is an excellent candidate to represent a gas-bearing dark matter halo with (almost) no stellar population in our own Local Group. The deep optical image reveals no associated stellar component but does result in the detection of new background galaxy clusters. Image Credit: E. A.K. Adams (ASTRON) and S. Janowiecki (Indiana University)	poster_agc198606.pdf 

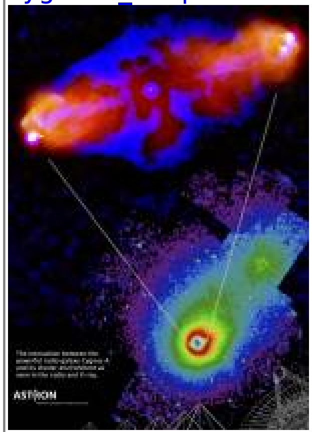
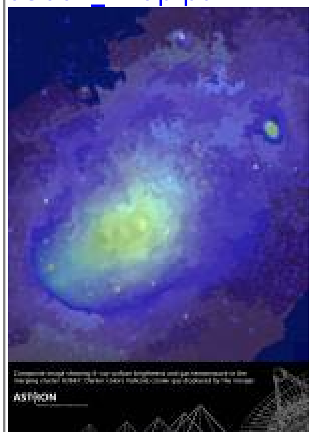
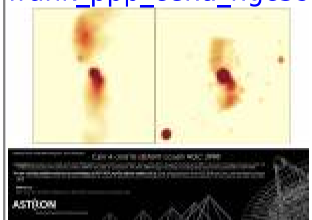
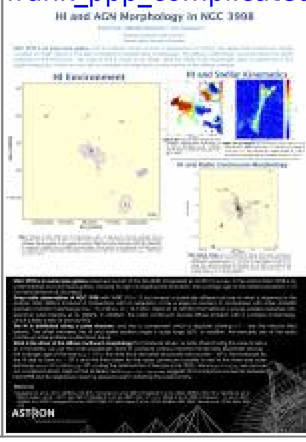
NGC 2841	Erwin de Blok	The velocity field of NGC 2841. Red shows gas rotating away from us, blue gas coming towards us	n2841_poster_deblok.pdf 
CO and HI from THINGS and HERACLES	Erwin de Blok	Distributions of neutral hydrogen (gray) and CO molecular gas (red) in a number of nearby galaxies. Center: M51. Clockwise from top-left: NGC 7331, NGC 3198, NGC 3077, NGC 3351, NGC 2903.	coandhi_poster_deblok.pdf 
M81 and starformation	Erwin de Blok	A multi-wavelength view of the galaxy M81. Cyan shows the neutral hydrogen as observed with the VLA. Purple shows the young stars as observed with GALEX. Brown shows the old stars observed with Spitzer.	m81_poster_deblok.pdf 
HERACLES and THINGS	Erwin de Blok	A multi-wavelength view of galaxies observed as part of the HERACLES and THINGS survey. In each panel from left to right: CO, HI, HI kinematics, old stars, recent star formation.	heracles_poster_deblok.pdf 

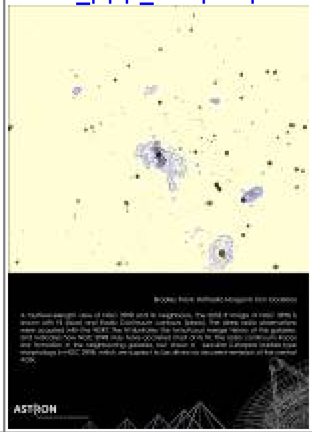
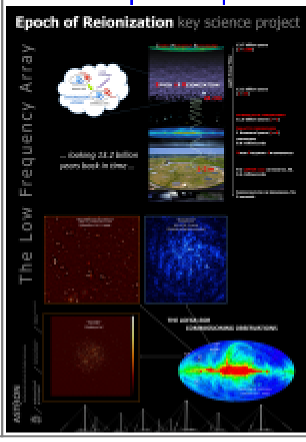
Lockman Hole	Elizabeth Mahony	The Lockman Hole field at 150 MHz as observed by LOFAR. I'll submit this as a daily image when I finish reducing the data and get a better image.	appp_lockman.pdf 
3C293	Elizabeth Mahony	The nearby radio galaxy 3C293. The large scale structure observed by Westerbork is shown in orange and overlaid on an optical image. On smaller scales there are inner jets seen with the global VLBI array (shown in blue). Observing the neutral gas in this galaxy with Westerbork and the VLA reveals that these radio jets are pushing cold gas out of the centre of 3C293 at speeds of up to 1200 km/s. I have already submitted this image to the daily image last year.	appp_3c293.pdf 
PSR J1713+0747 Dynamic Spectrum	Cees Bassa	TBD	j1713_dspec.pdf 

LEAP single pulses	Cees Bassa & Gemma Janssen	TBD	leap.pdf 
Low-Frequency Profiles of Millisecond Pulsars at 150 MHz with LOFAR	Vlad Kondratiev	[NOTE: Paper is nearly submitted. AJDI will be submitted when paper is accepted.] Low-frequency profiles of millisecond pulsars (MSPs) with LOFAR at the frequency range of 110-188 MHz. LOFAR detected 46 MSPs out of 57 observed so far. This is the largest sample of MSPs ever observed and detected with a single radio telescope at these low frequencies. Regular monitoring of pulsar dispersion and rotation measures and scattering in the interstellar medium (ISM) will provide an “ISM weather report” to improve pulsar timing precision at higher observing frequencies.	lofar-msp-profiles-invert2.pdf 
Simulation of a gamma-ray binary outflow	Javier Moldon	TBD	jmoldon.pdf 
Picture from space done by Children	Nicolas Vilchez	Since 2013, ASTRON is partner of the Fleurance (France) young astronomy festival. Last year, children built a basket which contained a GoPro camera, pressure, temperature, radioactivity sensors and a GPS tracker. The basket has been sent to space up to 37 km altitude using a stratospheric balloon. The picture is at 34.k km altitude	from_space.pdf 

Selfcalibrated image of J1441+1331 field with HBA LOFAR data	Nicolas Vilchez	To generate this image on J1141+1331 field, I ran selfcal.py on 14 groups of 20 subbands each and concatenate them after. The image resolution is 5'', and the fov of the image is 4°x1.6°. The initial noise before the concatenation was ~1.5 mJy. After the concatenation, the final noise is ~0.5 mJy and the thermal noise is ~0.2 mJy.	j1441_1331.pdf 
Solving the Puzzle of Pulsar Emission with LOFAR	Maura Pilia	(NOTE: Expandable, would like to wait till paper submitted, ca 3weeks) Observations of 100 pulsars with LOFAR LBAs (40 Mhz) and HBAs (140 MHz), WSRT (at P-band, 400 MHz) and the Lovell Telescope (at L-band, 1400 MHz). We compare the profiles of the pulsars at the different frequencies and study their evolution.	appp_maura.pdf 
LOFAR's First 100 Pulsars	Maura Pilia	(NOTE: alternative to the other) Observations of 100 pulsars with LOFAR LBAs (40 Mhz) and HBAs (140 MHz), WSRT (at P-band, 400 MHz) and the Lovell Telescope (at L-band, 1400 MHz). The evolution of the pulse profile with frequency help us explore the properties of the magnetosphere of the pulsar and of the medium between us and the pulsars.	appp_maura2.pdf 
The Crab Pulsar and the Crab Nebula	Joeri van Leeuwen	The Crab Pulsar and the Crab Nebula are one impressive pair as seen with ASTRON's Westerbork and ESO's VLT telescopes. Only 10 miles across but 500.000 times as massive as the Earth, the pulsar is a cosmic lighthouse that spins 30 times each second, sweeping around bundles of bright radio waves. In this image we see a 1-second snapshot of these peaked waves as they reach Westerbork/PuMaII after 6000 years of interstellar travel.	jvl-crab-01.pdf 

Radio Waves I	Joeri van Leeuwen	Drifting subpulses in PSR B0809+74.Single pulses from pulsar B0809+74 exhibit secondary periodicities - waves on waves. These ‘drifting subpulses’ are likely made by emitting structures (such as sparks of filaments) in the pulsar magnetosphere.	jvl-radiowaves-01.pdf 
Pulsar discoveries with LOFAR	Joeri van Leeuwen	The LOFAR antennas that are most central (left), and thus provide the highest filling factor and survey speed are used for the LOFAR pulsar surveys. See (right) the peaked signals of the first six discovered pulsars! Original data: www.astron.nl/lotaas/	jvl-lofarpsrs-01.pdf 
Stretching the fabric of space-time	Joeri van Leeuwen	Shapiro delay in PSR J1802-2124. Pulsars and white dwarfs are extremely massive and compact.Their density and gravitational pull are gigantic, stretching both space and time in their vicinity. When you look at a radio pulsar passing behind a white dwarf, you can actually see its light slow down as it struggles past the white dwarf.	jvl-shapirodelay-01.pdf 
3C452	Raffaella Morganti	The complexity of 3C452 seen by LOFAR at 150 MHz	3c452.pdf 
B2 0258	Raffaella Morganti	A radio relic with, in the centre, the recent restarted radio source: B2 0258+35	b0258.pdf 
Cygnus A	Michael Wise	The interaction between the powerful radio galaxy Cygnus A and its cluster environment as seen with LOFAR (red), the VLA (green), and Chandra (blue).	cygnusa.pdf 

Cygnus A	Michael Wise	The interaction between the powerful radio galaxy Cygnus A and its cluster environment as seen in the radio and X-ray.	cygnusa_fov.pdf 
A3667	Michael Wise	Composite image showing X-ray surface brightness and gas temperature in the merging cluster A3667. Darker colors indicate cooler gas displaced by the merger.	a3667_tmap.pdf 
Cen A and NGC 3998	Bradley Frank	Comparison between radio continuum image of a scaled-down Cen A and NGC 3998	frank_ppp_cena_ngc3998.pdf 
Radio Bubbles in NGC 3998	Bradley Frank	Detailed analysis of NGC 3998 using WSRT observations. Here we determine the timescales necessary to discern between a starburst and AGN driven origin of the peculiar radio continuum emission	frank_ppp_complicated.pdf 

Environment of NGC 3998	Bradley Frank	HI and radio continuum from WSRT overlaid on SDSS R-band image of NGC3998 and its neighbours.	frank_ppp_simple.pdf 
EOR	Ger de Bruyn	TBD	lofar-eor-poster.pdf 

Printing

You can print posters on the “HP-DJZ5200” poster printer near the drawing room. Overview: here and here.

General Presentations

Upload your contributions as ppt when possible! Only then we can easily adapt parts of your presentation for a new one. These are the newest and most used presentations. More (older) presentations are found in the Archive.

Introduction to ASTRON and astronomy (for high-school students, v2012)
presentatie_middelbare_school_juli_2012_compleet.pptx

Radiotelescoop op de Maan? Introductie van (Radio)Sterrenkunde en ASTRON. Deel van een opdracht voor studenten van het Technasium in Hoogeveen (in dutch). PDF version or ODP version

Introduction to ASTRON astronomy (presented by GH for Nijmegen BSc/Master students visit - May 2011 - heavily biased toward nearby galaxy stuff - in English) Keynote tarball or PPT exported from keynote or PDF version

Introduction to ASTRON (for high-school students) **(in English)**
research_astron_21-04-2011_vlad_eng.ppt (odp)

Elementary school presentation, long version with several subjects
basisschoolpresentatie_2012_lange_versie.ppt

Elementary school presentation (life of stars; compact objects; what do astronomers do?)
lagereschool01.ppt kids_lezing_leven_van_een_ster.ppt

Pulsar presentation, high-shool and general audience, includes movies, sounds, etc. Zipped powerpoint file, 100MB