Parkes: Fifty years in fifteen minutes

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Head of Science Operations
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"It's the telescope of the future.
It can look back millions of years."

"Life can only be understood backwards, but it must be lived forwards.’’

– Kierkegaard
Year

- High impact paper(s)
- Other event(s) of note
- World event(s)
- Best picture
Caveats

• This is the wrong talk to give
• This is the wrong time to give it
• This is the wrong audience for it
Caveats

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• This is the wrong audience for it

• I didn’t do it!
• I wasn’t there!
• It wasn’t me!
More caveats

• Impact based on citations given by ADS
  • “The Citation database in the ADS is NOT complete. Please keep this in mind when using the ADS Citation Lists.”

• Citation counts less accurate the further back in time

• Searching for “Parkes” in the abstract will often miss Nature and Science papers…

• …but will pick up lots of papers not reporting the results of Parkes observations
1961

- Parkes telescope opened
- John Bolton OIC
- World population 3 billion
- Gagarin orbits Earth
- Berlin Wall contructed
- Catch 22 published
1962

- Telescope commissioning ends
- Gardner & Whiteoak polarisation
- Cooper & Price Faraday rotation
- John Glenn orbits Earth
- Marilyn Monore dies
- Cuban missile crisis
- West Side Story
Polarization of 20-cm Wavelength Radiation from Radio Sources

F. F. Gardner and J. B. Whiteoak
Radiophysics Laboratory, Commonwealth Scientific and Industrial Research Organization, Sydney, Australia
(Received July 11, 1962)

Linear polarization has been detected at a wavelength of 20 cm in the radiation from a number of extragalactic and galactic radio sources. In one case, the observed percentage polarization is as high as 38%. The observations were carried out with a parametric receiver on the 210-ft steerable reflector of the Australian National Radio Astronomy Observatory at Parkes, New South Wales.

Those sources found to be polarized are listed in Table I. The data given include the percent-
also obtained for Sagittarius A (the nucleus of our galaxy), from which the radiation is partly thermal in origin. Polarization was not detected in two supernova remnants, Puppis - A and Kepler's Nova, but was observed in a third, Vela - X. Of the nine extragalactic sources investigated, polarization was detected in all but two, Hydra - A and 3C - 273. The existence of linear polarization considerably strengthens the hypothesis that the synchrotron mechanism is responsible for the radiation from the nonthermal sources.
Investigation of the Radio Source 3C 273 By The Method of Lunar Occultations (Hazard, Mackey & Shimmins)

Polarization of Radio Sources and Faraday Rotation Effects in the Galaxy (Gardner & Whiteoak)

A Radio Source with a Very Unusual Spectrum (Bolton, Gardner, Mackey)

Flare stars

Bogle & Chandler

JFK assassinated

Lawrence of Arabia
1964

- First zone of 408MHz survey (Bolton et al.)
- Detection of the Interstellar OH Lines at 1612 and 1720 Mc/sec (Gardner et al. PRL)
- Beatles tour Australia
- Tokyo Olympics
- Tom Jones
1965

- 18m Kennedy antenna operational
- Radio emission from Uranus (Kellermann)
- The supernova of A.D. 1006
- IDs of radio sources
- Menzies commits troops to Vietnam
- My Fair Lady
1966

- 21 cm hydrogen-line survey of the Large Magellanic Cloud. II. Distribution and motions of neutral hydrogen (McGee & Milton)
- PKS 0106+01 at z=2.1
- ASA founded
- Decimal currency introduced
- St Kilda win Grand Final
- England win World Cup
- The Sound of Music
1967

- Parkes Hydrogen-Line Survey of the Milky Way I. The Galactic Center (Kerr & Vallak)
- PKS0237-23 at $z=2.22$
- PM Holt disappears while swimming
- Expo 67 World’s Fair in Montreal
- Younger than Yesterday (The Byrds)
- A Man for All Seasons
THE REDSHIFT AND ABSORPTION-LINE SPECTRUM OF PKS 0237—23

Bolton has identified a new radio source, PKS 0237—23, measured at Parkes, with a stellar object, and spectra obtained by Arp and Kinman, together with photometry, showed definitely that the source was a quasi-stellar object; the emission lines gave a large redshift (Arp, Bolton, and Kinman 1967).
1968

• Discovery of pulsars announced
• “Measurements on the Period of the Pulsating Radio Source at 1919 +21” (Radhakrishnan, Komesaroff, Cooke)
• Parkes catalogue zone +20<dec>+27
• Prague Spring
• Mexico City Olympics
• In the Heat of the Night
1969

- “Magnetic Poles and the Polarization Structure of Pulsar Radiation” (Radhakrishnan & Cooke)
- Vela glitch (Radhakrishnan & Manchester)
- Apollo 11
- Oliver!
1969 Apollo 12 support team
1970

• A Survey of H 109 α Recombination Line Emission in Galactic H II Regions of the Southern Sky (Wilson, Mezger, Gardner, Milne) with NRAO 6cm cooled receiver
• Metric Conversion act passed
• Midnight Cowboy
• Abbey Road
1971

- Observations of Pulsar Polarization at 410 and 1665 MHz (Manchester)
- John Shimmins OIC
- Wild replaces Bowen as Chief of RP
- First McDonalds opens in Australia
- Rabbitohs win grand final
- Patton
1972

- The Parkes Hydrogen Line Interferometer: ApJS vol 24., first 5 papers (Radhakrishnan, Goss, Murray, Brooks…)
- Whitlam becomes PM
- Munich Olympics
- The French Connection
1973

- Discoveries of interstellar methanimine CH2NH and thioformaldehyde CH2S (Godfrey, Brown, Robinson & Sinclair)
- Tidbinbilla 64m completed
- Aluminium panels to 37m
  - $50 note issued
  - QEII opens Opera House
  - The Godfather
  - Dark Side of the Moon (Pink Floyd)
1974

- Magellanic stream (Mathewson, Cleary & Murray) with Parkes 18m
- Extragalactic formaldehyde (Gardner & Whiteoak)
- Prince Charles inaugurates AAT
- World population 4 billion
- Abba win Eurovision
- Cyclone Tracy devastates Darwin
- The Sting
1975

- H I absorption measurements yielding kinematic distances for 42 continuum sources in the galactic plane (Caswell, Murray, Roger, Cole, Cooke)
- First VLA antenna in place
- Fraser becomes PM
- The Godfather Part II
1976

• A study of galactic supernova remnants, based on Molonglo-Parkes observational data (Clark & Caswell)
• First commercial flight of a Concorde
• Montreal Olympics
• One Flew Over the Cuckoo’s Nest

Fig. 7. Galactic distribution for SNRs with $D < 36$ pc. Open circles denote younger remnants ($D < 32$ pc); filled circles denote older remnants of lower surface brightness and larger angular size. Solid lines are directions tangential to spiral arms; broken lines are possible tangential directions (from Green 1972).
1977

- Optical, infrared, and radio studies of AFCRL sources (Allen et al.)
- “Pulsars” (Manchester & Taylor) published
- Apple incorporated
- Granville train disaster
- Elvis dies
- Rocky
- Bat out of hell (Meatloaf)
1978

- A southern hemisphere survey of the galactic plane at 5 GHz (Haynes, Caswell & Simons)
- Second Molonglo pulsar survey
- Sydney Hilton bomb
- Jonestown massacre
- Annie Hall
1979

• Galactic supernova remnants - Dependence of radio brightness on galactic height and its implications (Caswell & Lerche)
• 14th and final part of 2.7GHz survey published
• Thatcher elected
• Iran hostage crisis
• The Deer Hunter
1980

- Galactic plane H2O masers - A southern survey (Batchelor et al.) with Parkes 17m & 37m
- TEST - Two Element Synthesis Telescope
- VLA inaugurated
- Pac-man released
- Azaria Chamberlain disappears
- Kramer vs Kramer
- East (Cold Chisel)
Simultaneous X-ray, ultraviolet, optical, and radio observations of the flare star Proxima Centauri (Haisch et al.)

- Jon Ables OIC
- Charles and Diana wed
- Ordinary People
- Business as Usual (Men at Work)
1982

- PKS 2000-330 at $z=3.78$
- Aluminium panels to 44m diameter
- First Parkes VLBI
- Falklands War
- Commodore 64 released
- First emoticons :-)
- Chariots of Fire
- 10,9,8,7,6,5,4,3,2,1 (Midnight Oil)

A 408 MHz all-sky continuum survey. II — The atlas of contour maps
(Haslam, Salter, Stoffel, Wilson)
1983

• The galactic abundance gradient (Shaver et al.)
• Pulsar discovered in LMC
• Observatory car collides with Indian-Pacific train!
• Hawke become PM
• Australia wins America’s Cup
• Gandhi
• Too Low for Zero (Elton John)
1984

- A neutral hydrogen line survey of the LMC (Rohlfs et al.)
- Medicare comes into effect
- Advance Australia Fair becomes national anthem
- $1 coin introduced
- Los Angeles Olympics
- Terms of Endearment
- Born in the USA (Bruce Springsteen)
1985

- A search for short-period pulsars (Manchester, D’ Amico & Tuohy)
- Windows 1.0 released
- Amadeus
- Brothers in Arms (Dire Straits)
1986

• Fully sampled H I survey of the southern Milky Way (Kerr et al) with Parkes 18m
• Voyager at Uranus, Giotto at Halley’s comet
• Mt Pleasant telescope
• Challenger disaster
• Chernobyl
• Out of Africa
• Whispering Jack (John Farnham)
The world before the web, blogs and twitter...

Call Halley’s comet

For a weekly update on the comet and associated phenomena, dial Sydney or Brisbane 11622 or Melbourne 11613. The weekly scripts for this joint Telecom-CSIRO community service are prepared by Dr Ray Norris of the CSIRO Division of Radiophysics.

Ecos 47, Autumn 1986 5
1987

- Southern H II regions - an extensive study of radio recombination line emission (Caswell & Haynes)
- SN1987A
- World population 5 billion
- Platoon
- Crowded House
1988

- The structure of the SMC. II (Mathewson, Ford & Visvanathan)
- Australian Bicentennial
- ATCA opened
- NRAO 300’ collapsed
- MOU signed for participation in RadioAstron
- First polymer banknotes
- Seoul Olympics
- The Last Emperor
- Kick (INXS)
1989

- Large peculiar velocities in the Hydra-Centaurus supercluster (Aaronson et al.)
- Internet to Australian Uni’s
- VAX 11/750 replaced by MicroVax 3400 for $172,000
- Dave Cooke OIC
- Tidbinbilla 64m → 70m
- Berlin Wall comes down
- Australian pilots strike
- Rain Man
- …Ish (1927)
1990

- Parkes Catalog (Wright & Otrupcek)
- PMN survey observations made
- ATNF formed
- HST launched
- Nelson Mandela released
- Driving Miss Daisy
- The Immaculate Collection (Madonna)
1991

- 1612 MHz OH survey of IRAS point sources. I (te Lintel Hekkert)
- Millisecond pulsars in 47 Tuc
- Ron Ekers plants apple tree
- First light with Mopra
- WWW debuts
- Keating becomes PM
- Dances with Wolves
GRAVITY

Just a theory

www.jacanaent.com
1992

- PSR 1259-63 - A binary radio pulsar with a Be star companion (Johnston et al.)
- One person operation of the telescope
- “Beyond Southern Skies” published
- Astro-ph server started
- NASA/ADS launched
- Barcelona Olympics
- The Silence of the Lambs
NEW MEXICO, 1982

WE’VE GOT A SINGLE TRANSMISSION IN MORSE FROM THE APPARENT DIRECTION OF EPSILON INDI. READS: “GREETINGS. WE HAVE MONITORED YOUR AUDIO TRANSMISSIONS AND WOULD LIKE TO KNOW WHAT YOU LOOK LIKE?”

IN ENGLISH? NO REPEAT? CLEAR HOAX, IGNORE IT.

NEW MEXICO, 2004

“I’M SIX-FOOT TWO AND I LOOK LIKE CHRISTOPHER REEVE. YOU?”

NOW DON’T SEND THAT.

C’MON, SOMEBODY’LL GET A LAUGH OUT OF IT.

WE’VE GOT A SINGLE TRANSMISSION IN MORSE FROM THE APPARENT DIRECTION OF EPSILON INDI. READS: “WHAT ARE YOU WEARING?”
1993

- The Parkes-MIT-NRAO (PMN) surveys. I - The 4850 MHz surveys and data reduction (Griffith & Wright)
- EU established
- Clinton US President
- Unforgiven
1994

- The PMN surveys. 2: Source catalog for the southern survey -87.5<dec<-37 (Wright, Griffith, Burke, Ekers)
- Six staff made redundant at Parkes
- Marcus Price OIC
- Kurt Cobain dies
- Ayrton Senna dies
- Schindler’s List
1995

• Relativistic motion in a nearby bright X-ray source (Tingay et al.)
• Project Phoenix uses Parkes and Mopra, Feb—June
• Two month shutdown for new focus cabin installation
• The DVD announced
• eBay founded
• Oklahoma City bombing
• Forrest Gump
1996

- The Parkes 21 cm multibeam receiver (Staveley-Smith, Wilson, Bird, Disney, Ekers, Freeman, Haynes, Sinclair, Vaile, Webster, Wright)
- Galileo tracking
- Howard becomes PM
- Diana dies
- Atlanta Olympics
- Braveheart
• Discovery of Numerous Dwarf Galaxies in the Two Nearest Groups of Galaxies (Cote, Freeman, Carignan & Quinn)
• Continued Galileo tracking
• MB20 receiver installed
• First Harry Potter novel
• Adelaide Crows win AFL Grand Final
• The English Patient
• Tidal disruption of the Magellanic Clouds by the Milky Way (Putman et al.)
• John Reynolds OIC
• GST introduced
• Titanic

Figure 1 The 2,400 square-degree mosaic of the South Celestial Pole, with the main features labelled, including the area containing the newly identified Leading Arm. The Stream extends 100° beyond its labelled starting point. This image is a peak neutral hydrogen intensity map using the first scans of HIPASS data (see text) in the velocity range $v_{\text{los}} = 62$ to 400 km s$^{-1}$. Declination $-90°$ is at the centre, with the edge of the image extending to declination $-62°$. Right ascension $0\,\text{h}$ is at the top of the figure and increases anticlockwise. Note the lack of H\textsc{i} emission in the region between the SMC and Leading Arm. Discontinuity of emission at the Galactic Plane is an artefact of the bandpass correction.
1999

- The large-scale HI structure of the SMC (Stanimirovic, Staveley-Smith, Dickey, Sault, Snowden)
- World population 6 billion
- Euro established
- Mars Climate Orbiter lost
- Y2K feared
- Shakespeare in Love
The large-scale H structure of the Small Magellanic Cloud
2000

- Discovery of Two High Magnetic Field Radio Pulsars (Camilo et al.)
- Sydney Olympics
- Expanded VC opened
- American Beauty
"AN INSPIRED HUMAN COMEDY."

As Neil Armstrong set foot on the moon, our only link was a satellite dish in rural Australia with a few bugs.

(And a few hundred sheep.)

The Dish

Based on the true story of what we didn't see.
2001

- Parkes Multi-beam Pulsar Survey (Manchester et al.) and HIPASS (Barnes et al.) papers
- Centenary of Federation
- 9/11
- Gladiator
2002

- HIPASS High-Velocity Clouds: Properties of the Compact and Extended Populations (Putman et al.)
- 10/12 Bali bombing
- A Beautiful Mind
2003

- A Warped Accretion Disk and Wide-Angle Outflow in the Inner Parsec of the Circinus Galaxy (Greenhill et al.)
- Al panels to 55m
- 10/50 & Mars receivers
- Mars tracking
- IAU GA in Sydney
- “First bite” at the Dish Café
- Last flight of Concorde
- Columbia shuttle disaster
- Chicago
2004

• A Double-Pulsar System: A Rare Laboratory for Relativistic Gravity and Plasma Physics (Lyne et al.)
• Sumatra earthquake and tsunami
• Boston Red Sox win World Series
• Lord of the Rings…
2005

• The HIPASS catalogue: $\Omega_{\text{HI}}$ and environmental effects on the HI mass function of galaxies (Zwaan et al.)

• ATNF Pulsar catalogue

• Huygens at Titan

• GASS starts in Jan

• Sydney Swans win AFL Grand Final

• Liverpool wins Champions League

• Million Dollar Baby
2006

- Transient radio bursts from rotating neutron stars (McLaughlin)
- GASS completed in Nov
- Pluto demoted
- Crash
• 1E 1547.0-5408: A Radio-emitting Magnetar with a Rotation Period of 2 Seconds (Camilo, Ransom, Halpern, Reynolds)
• S-PASS starts
• Upgrade of Quarters completed
• Comet McNaught
• The Departed
2008

- Ultra-high energy cosmic rays, spiral galaxies and magnetars (Ghisellini et al.)
- Fermi launched
- Beijing Olympics
- Quentin Bryce becomes first female Governor General
- No Country for Old Men
2009

- Radio Detection of LAT PSRs J1741-2054 and J2032+4127: No Longer Just Gamma-ray Pulsars (Camilo et al.)
- IYA
- CASS formed
  - Victorian bushfires
  - H1N1 Swine flu
  - Michael Jackson dies
  - Slumdog Millionaire
2010

• A Radio-loud Magnetar in X-ray Quiescence (Levin et al.)
• 12.2-GHz methanol masers towards 1.2-mm dust clumps (Breen et al.)
• S-PASS completed
• Eyjafjallajökull volcano erupts
• The Hurt Locker

GARDENING

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Edited By: R.T. Choke.

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2011

- Parkes 50th Celebrations
- RadioAstron launched
- World population 7 billion
- Japanese earthquake and tsunami
- The King’s Speech
It’s all been a bit of a blur…
“One could readily justify the establishment of observatories with large telescopes in the southern hemisphere because only there can one study the Magellanic Clouds”

– Bart Bok (1957)
Conclusions

• Parkes has produced high impact science in a wide range of fields
  • H I, galactic structure, LMC & SMC, SNRs, surveys …
  • Quasars, OH, planets, molecules, RRLs, masers, pulsars, VLBI …

• Continual upgrading of surface, receivers, backends, connectivity
  • Importance of spacecraft tracking contracts and collaborations with user community

• Excellent support staff
• The Dish is an icon
So where does that leave us?
"It's the telescope of the future.

It can look back billions of years…
and can look forward to many more!
Thank you