

# CURRICULUM VITAE

## Personal Information:

Name: Renée C. Kraan-Korteweg

Date, place of birth: May 7, 1954 in Amsterdam, The Netherlands

Nationality: The Netherlands

Academic title: Dr. phil II, University of Basle, Switzerland

Current position: Chair of Astronomy  
Co-director of Astrophysics, Cosmology and Gravity Centre  
University of Cape Town  
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Marital status: married to Pieter Kraan

Children: Christiaan Friso, 10.1.1979  
Tiemo Ernst, 20.1.1981 – 7.12.1997  
Marisa Renée, 10.5.1983

Languages: Dutch (good)  
German (very good)  
English (very good)  
Swiss-German (very good)  
French (good)  
Spanish (good)

**Educational Record:**

- Apr. 1960 - Apr. 1965: Primary school, Kloten ZH, and MuttENZ, BL, Switzerland  
Apr. 1965 - Apr. 1969: Realschule, MuttENZ, BL, Switzerland  
Apr. 1969 - Oct. 1972: Gymnasium, Münchenstein, BL, Switzerland
- Oct. 1972 - Apr. 1978: Studies of astronomy, physics and mathematics  
at the University of Basle, Switzerland  
Apr. 1978 - Apr. 1985: Graduate school at the Astronomical Institute  
of the University of Basle, Switzerland  
Thesis advisor: Prof. Dr. G.A. Tammann

**Degrees:**

- April 1972: “Eidgenössische Matura Typus C” (natural sciences)  
April 1975: “Vordiplom” in astronomy, physics and mathematics  
April 1978: “Diplom” in astronomy, experimental physics and mathematics  
April 1985: Doctorate phil. II in astronomy (magna cum laude)

**Professional Positions:**

- Apr. 1975 - Apr. 1978: Part-time research assistant  
Astronomical Institute, University of Basle, Switzerland  
Apr. 1978 - Apr. 1985: Research and teaching assistant  
Astronomical Institute, University of Basle, Switzerland  
Apr. 1985 - Apr. 1988: Post-doc research fellow  
Astronomical Institute, University of Basle, Switzerland  
Apr. 1988 - July 1991: Senior research fellow  
Astronomical Institute, University of Basle, Switzerland  
July 1991 - Dec. 1994: Fellowship of the Royal Dutch Academy of Sciences (KNAW-fellow)  
Kapteyn Astronomical Institute, Groningen, The Netherlands  
Dec. 1994 - July 1997: EC-postdoc  
Observatoire de Paris-Meudon, D.A.E.C., France  
July 1997 - July 1998: Investigador Nivel G, Cátedra Patrimonial de Excelencia Nivel II  
Departamento de Astronomía, Universidad de Guanajuato, Mexico  
Aug. 1998 - Aug. 1999: Profesor Titular A (associate professor)  
Departamento de Astronomía, Universidad de Guanajuato, Mexico  
Aug. 1999 - Dec. 2004: Profesor Titular B (full professor)  
Departamento de Astronomía, Universidad de Guanajuato, Mexico  
Feb. 2002 - Dec. 2004: Head of the Astronomy Department  
Universidad de Guanajuato, Mexico  
Jan. 2005 - Dec. 2014: Head of the Astronomy Department  
Department of Astronomy, University of Cape Town, South Africa  
Jan. 2005 -  
Chair of Astronomy  
Department of Astronomy, University of Cape Town, South Africa  
July 2009 -  
Founder & Co-Director Astrophysics, Cosmology and Gravity Centre  
(ACGC), Univ. of Cape Town, South Africa

**Honours:**

- Elected UCT Fellow, 2015
- Elected Chair of Astronomy Advisory Council (AAC), 2014
- Nominated member of the newly founded Astronomy Advisory Council (AAC), 2013–2016
- Elected Fellow of the Royal Society of South Africa, 2012 (induction 2014)
- Elected Vice-President of the International Astronomical Union (IAU), 2012
- Excellence Level 1 Award, UCT, for exceptional national leadership in Astronomy, 2011–2015; 2016 – 2019
- 2nd runner-up in the category of Distinguished Women in "Life, Natural and Engineering Sciences" for the 2011 Women in Science Award, organised by the South African Dept of Science and Technology
- Elected member of the Academy of Science of South Africa 2010
- NRF rating (South Africa) 2005 – 2009; 2010 – 2016: B1
- CONACyT rating (Mx) 1999 – 2001; 2002 – 2004: SNI II
- 1994: Entry in the yearbook of the Encyclopedia Britannica

**Professional Society and Science Group Memberships (current):**

- 2009 - 2013 : Member of the South African SALT Telescope Time Allocation committee
- 2009 - present: Member of the Wallaby (ASKAP) Project
- 2009 - present: Member of 3 of the 4 UCT-led MeerKAT proposals:
  - Laduma (Deep HI Survey; member of coordinating council discussing issues of science and policy; Co-PI of 'Halo-selected Samples' SWG
  - MHongoose (Very Deep Survey of Nearby Galaxies)
  - MIGHTEE (Deep Continuum Survey)
- 2010 - present: Member of the APERTIF projects:
  - WNSHS (Westerbork Northern Sky HI Survey); PI of ZOA SWG
  - Medium Deep HI Survey
- American Astronomical Society (AAS), Astronomische Gesellschaft (AG), European Astronomical Society (EAS), International Astronomical Union (IAU), Schweizerische Gesellschaft für Astronomie und Astrophysik (SGAA), South African Institute for Physics (SAIP), Academy of Science of South Africa (ASSAf)

### **Committees, Administrative tasks:**

- Regular refereeing for the *Astronomical Journal*, *Astronomy & Astrophysics*, *Monthly Notices of the Royal Astronomical Society*, and *Publications of the Astronomical Society of Australia*
- Regular refereeing of research projects for CONACyT (Mx), the Netherlands Organisation for Scientific Research (NWO, the Dutch research council), the South African National Research Foundation, and the Dept. of Physics, UNM, Albuquerque
- Regular evaluations of the research outputs of faculty members requested by the South African National Research Foundation, and the Dept. of Physics, UNM, Albuquerque
- Member of the “External Evaluation Committee” of the Instituto de Astronomía, U.N.A.M., Mexico: January 2002 - December 2004 (hiring, promotions)
- Head of the “Astronomy Department”, Univ. of Guanajuato: as of February 2002 – December 2004
- Evaluation of the astronomy graduate programs in Mexico (summer 2002) upon request by the Mexican National Science Foundation CONACyT (Mx)
- Secretary of the Mexican National Committee of the International Astronomical Union (IAU), June 2003 – Dec 2004
- Member of the Organizing Committee of Commission 28 (Galaxies) of the International Astronomical Union (IAU), June 2003 – June 2009
- Head of the Department of Astronomy, University of Cape Town, 2005 – 2014
- Member of the NASSP (National Astrophysics and Space Science Programme) Steering Committee, July 2005 – 2014
- Member of SASTTAC (South African SALT Telescope Time Allocation Committee), 2005 - 2011
- Member of the Local Executive Committee of NASSP, July 2006 – 2014
- Leader of the NRF Research Niche Area (RNA): Extragalactic Astronomy and Cosmology, 2006 – 2013
- Founder and Co-director of the “Astrophysics, Cosmology and Gravity Centre (ACGC)”, established in 2009 at UCT
- Member of PHISCC (SKA Pathfinder HI Surveys Coordination Committee); since November 2009 – 2015
- Member of the South African NRF Rating Panel for Physics, 2009 – 2011
- Chair of national committee of senior astronomers to prepare and finalize a report on Human Capacity Development in Astronomy in South Africa for the NRF and DST (2010-2011)
- Member of the Selection Committee of the Dean of the Science Faculty of UCT (2010)
- Nominated Chair of the Search Committee to find a replacement for the Director of the South African Astronomical Observatory, 2010
- Appointment by Dept Science & Technology to support the Astronomy Desk who advised

the Minister on strategic matters regarding the development of Astronomy in South Africa (2010 - 2011)

- Invited Member of the IAU Executive Committee on Future Large Scale Facilities (since June 2011)
- Vice-President of the International Astronomical Union (IAU), 2012 – 2018
- Chair of Astronomy Advisory Council (AAC), since 2014 – 2016
- Member of the newly founded Astronomy Advisory Council (AAC) 2013 – 2016
- Member of the Selection Committee to headhunt and hire a Chief Scientist of the SA SKA Office (2014)
- Member of the South African SKA Science Committee (2014 – 2016)
- Member of the Steering Committee of the OAD (Office of Astronomy for Development) of the IAU, 2015 – 2017
- Designated Chair of the Steering Committee of the OAD (2018 – 2020)

## **PROFESSIONAL EXPERIENCE:**

### **• University of Basle, Switzerland, 1985–1991:**

– Practical astronomy exercises and laboratory (2 hours/week from 1985-1991 for undergraduate physics and astronomy students)

### **• University of Groningen, The Netherlands, 1991–1994:**

– Supervision and co-supervision of graduate students in their research projects  
– Organization and chairing of lunch talks

### **• Observatoire de Paris-Meudon, France, 1995–1997:**

– Supervision of undergraduate students and graduate students in their research projects (honours theses, respectively stages de Magistère, and master theses, respectively stage de D.E.A., PhD) as well as co-supervision of PhD student

### **• University of Guanajuato, Mexico 1997–2004:**

Class room teaching:

– Astronomy and physics courses plus exercises (one 4h/week course per semester) since the implementation in August 1998 of the physics and astrophysics undergraduate program

Other:

– Organizer of the Astronomy Colloquia (10.1997 – 02.2002)  
– Supervision of undergraduate and graduate students, tutoring

Teaching-related Committees:

– Member of the “Comité de Licenciatura” (Jan – Jun 1998) to develop a physics/astrophysics undergraduate program; implemented Aug 1998  
– Member of the “Comisión del Tronco Comun de las Ingenierías” (Oct 1998 – Jun 1999) to define a common program of the first 3 semesters with the University’s 16 engineering programs; implemented Aug 1999  
– Member of the “Comité de Docencia del IFUG” (Feb 1999 – Jan 2002)  
– Member of the Committee developing an astrophysics graduate program at the University of Guanajuato which was successfully launched in Aug 2004

• **University of Cape Town, South Africa 2005–now:**

Class room teaching:

- Masters course on “Extragalactic Astronomy”, NASSP (National Astrophysics and Space Science Programme), Univ. of Cape Town, 2005, 2006, 2007, 2008, 2009, 2010
- Undergraduate 3rd year astrophysics course AST3003S on “Galactic and Extragalactic Astronomy”, Univ. of Cape Town, 2006, 2007, 2009, 2010, 2012, 2013, 2014

Other:

- Supervision of graduate students, tutoring

Teaching-related Committees:

- Chair of Committee to develop an astrophysics undergraduate major which was successfully implemented in 2005
- Member of the NASSP Steering Committee (2005 – 2014)
- Member of the Local NASSP Executive Committee (2006 – 2014)

**Supervised theses:**

**(a) Doctoral theses:**

Graduated

- Patrick A. Woudt, “Large-Scale Structures Behind the Southern Milky Way”, Univ. of Cape Town, 1998
- Michelle E. Cluver, “The Nature and Nurture of a Starburst Supermassive HI Galaxy: HIZOA J0836-43”, Univ. of Cape Town, 2009 (**Awarded Medal for best UCT Science Faculty PhD of 2008**)
- Bonita de Swardt, “The Structure, Stellar Content and Dynamics of Dwarf Galaxies in the Local Volume”, Univ. of Cape Town, 2009
- Ed Elson, “A Multi-Wavelength Study of the Dwarf Galaxies NGC 2915 and NGC 1705: Star Formation and Dark Matter”, Univ. of Cape Town, 2010
- Ihab Riad, “A Deep Near Infrared Survey Along the Great Attractor Wall”, Univ. of Cape Town, 2010
- Paul Kotze, “The Evolution and Transformation of Galaxies in Superclusters at Intermediate Redshifts”, Univ. of Cape Town, May 2014

Ongoing

- Mpati Ramatsoku, “A Westerbork HI imaging survey of the Perseus-Pisces filament across the Zone of Avoidance”, University of Groningen, ASTRON, UCT, 2013 – present
- Khaled Said, “Peculiar Flow Fields in the ZoA from the NIR Tully-Fisher relation”, UCT, 2014 – present
- Nikki Pekeur, “The Optical Polarization of Fermi Blazars”, UCT, 2015 – present
- Narges Hatamkhani, “Unveiling of the newly discovered Vela Supercluster”, UCT, 2016 – present

**(b) Master theses:**

*Graduated*

- Patrick A. Woudt, “Large-Scale Structures Behind the Milky Way from the Hydra clusters to the Great Attractor Region”, Univ. of Groningen, 1994
- Toufik Mostefaoui, “A Blind HI-line Survey of Nearby Low HI-mass Dwarfs”, Obs. de Paris-Meudon, 1996
- Chadi Salem, “The Galaxy Distribution Behind the Milky Way between Puppis and Hydra as Uncovered in a Deep Optical Galaxy Search”, Obs. de Paris-Meudon, 1996
- Manuel Ochoa, “An Obscured Cluster of Galaxies in the Great Attractor Region”, Univ. of Guanajuato, 2002 **with distinction**
- Rosalind Skelton, “The Infrared Luminosity Function of the Norma Cluster”, NASSP MSc, Univ. of Cape Town, 2007 **with distinction**
- Paul Kotze, “A Deep Photometric Survey of the Abell Cluster S0423. - A Pilot Study for the UCT SALT Supercluster Survey”, Univ. of Cape Town, 2007
- Nebiha Shafi, “An HI Search for Galaxies Hidden by the Milky Way behind the Galactic Bulge”, NASSP, Univ. of Cape Town, 2008
- James Tagg, “Optimisation of the NIR Survey Strategy in Unveiling Galaxies in the Great Attractor”, NASSP, Univ. of Cape Town, 2008
- Roger Deane, “The Giant LSB Galaxy NGC 1512: A High Resolution Analysis of the HI, Star Formation and Dark Matter in this Nearby Interacting Galaxy”, NASSP, Univ. of Cape Town, 2008 **with distinction**
- Tana Joseph, “Towards an HI Census of the Local SDSS Galaxies”, NASSP, Univ. of Cape Town, 2009
- Nikki Pekeur, “The Relationship between the HI and Optical Diameter for a Sample of Galaxies from the Local Volume HI Survey (LVHIS)”, NASSP, Univ. of Cape Town, 02/2009 **with distinction**
- Zolile Mguda, “Matching stellar envelope models to ATLAS9 atmospheres for A-stars”, NASSP, Univ. of Cape Town, 12/2010
- Wendy Williams, “A multi-wavelength study of HI galaxies in the Zone of Avoidance”, Univ. of Cape Town, 06/2011 **with distinction**
- Kosma van Maltitz, “Galaxies in the ZOA: Does Vela Hide a Massive Overdensity at 20'000km/s?”, NASSP, Univ. of Cape Town, 06/2012
- Mpati Ramatsoku, “HI-Line Mapping of Large-scale Structures in the Zone of Avoidance”, NASSP, Univ. of Cape Town, 12/2012
- Khaled Said, “The NIR isophotal Tully-Fisher relation and its Cosmological applications in the Zone of Avoidance”, NASSP, Univ. of Cape Town, 12/2013
- Patrick Affadi, “A New Method of Mapping Flow Fields: Evaluating the Suitability of the Infrared bands Tully-Fisher Relation for ZOA Work”, NASSP, Univ. of Cape Town, 2015
- Ahmed Elagali, “The Vela Supercluster - does it provide the missing link to explain the

local flow fields?”, NASSP, Univ. of Cape Town, 12/2015

– Thembaloxolo Gqaza, “Optimisation of galaxy identification methods in large HI interferometric surveys - A preparation for the forthcoming Large MeerKAT HI Surveys”, NASSP, Univ. of Cape Town, July 2016 – present

### **(c) Undergraduate theses, honors:**

#### Graduated

– Rogelia Marquez, “A Blind Large-Volume HI-line Survey of High HI-mass Objects”, Obs. de Paris-Meudon, in 1995

– Frederic Assouline, “A Search for Galaxies Behind the Milky Way from Puppis to Hydra”, Obs. de Paris-Meudon, 1995

– Chadi Salem, “A Search for Galaxies Behind the Milky Way from Puppis to Hydra”, Obs. de Paris-Meudon, 1995

– Juan M. Islas Islas, “An HI search for galaxies hidden by the Milky Way”, Univ. de Guanajuato, 2004

– Mpati Ramatsoku, “The surprising ubiquity of HI gas in “red and dead” galaxies”, Univ. of Cape Town, 2010

– “A blind HI interferometric survey of a rich cluster in the ZOA”, NASSP Honours, UCT, 2015

### **Publication summary (cf. Publication list):**

- 82 publications in refereed journals, of which 1 submitted, plus 4 in advanced draft form
- 2 chapters (review articles) in a book
- 63 contributions to proceedings in international meetings
- 29 other publications (theses, abstracts, observatory newsletters, reports, astronomy and science magazines)
- 2 books as editor

### **Citations:**

Citations as listed in ADS (NASA Astrophysics Data System, which is not complete, see [http://adsabs.harvard.edu/abstract\\_service.html](http://adsabs.harvard.edu/abstract_service.html))

- Current ADS citations: ≈ 2950
- ADS citations excluding self citations: ≈ 2250
- Current ADS citations to articles as 1st author: ≈ 1250

3 of those with over 100 citations

– Impact: h-factor = 25



## **Research Grants since being in South Africa, 2005 – :**

### **(a) as Principal Investigator:**

- NRF Focus Area Research Grant FA2005031600007:  
“Extragalactic Structures in the Zone of Avoidance”, 2005 – 2008
- NRF Focus Area Research Grant FA2005033000022:  
“Cosmology with Nearby Dwarf and LSB Galaxies”, 2005 – 2009
- NRF Grant UID 60880 (PI of UCT Dept. of Astronomy):  
“Human Capacity Development for Multiwavelength Astronomy”, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014
- NRF/UCT Funding within the Institutional Research Development Programme for Research Niche Area (with Co-PI P. Dunsby, Cosmology, UCT): “Extragalactic Astronomy and Cosmology”, 2007 – 2012  
“The Final Unveiling of the Great Attractor Wall” (ICD2007053000001), 2007 – 2013
- NRF Incentive Funding:  
“Extragalactic Large-Scale Structures and the Zone of Avoidance”  
ZAR 80'000 per year for the period 2011 – 2016
- UCT PI of 3-year multilateral EU-FP7 IRSES project between NL (ASTRON), SA (UCT, US, Rhodes) and SW (Chalmers) of 350000 EU total to develop mid-frequency aperture arrays (the second stations that will be built as part of SKA in Karoo)  
2014 - 2016: 3 x 12000 EU per year for UCT exchanges
- PI of the “HI in the ZOA” project within the NWO/NRF Bilateral on Astronomy and Technologies for Astronomy (2013-2016) within key project on HI-surveys (of which S Blyth is overall coordinator)  
Funding for exchanges within my ZOA project is a total for 3 years of :  
2014 - 2016: total of ZAR 213000.– plus EU 18725.
- Various positions generated for the Astronomy Department at UCT:  
1 SKA funded Lecturer position, 2009 - 2014  
1 SKA funded Lecture position, 2015 – 2018  
1 SARChI Chair (includes 2 PDRF + 2PhD + 2MSc + 1admin); 2007 – 2021  
1 SKA Chair (includes 2 PDRF + 2PhD + 2MSc + 1admin); 2011 – 2026  
1 joint CT/UWC SKA Chair position; 2014 2018  
3 Postdoctoral fellows not associated with above research grants
- 2011 Sabbatical support from various international funders:  
Observatoire de Paris-Meudon (6000EU); the Dutch National Science Foundation for 6 months (12000EU), the Helena Kluyver Female Visitor Program at ASTRON (the Dutch Radio Astronomy Institute; 3000EU); Distinguished Visitors Program if ICRAR (International Centre for Radio astronomy Research; accommodation and some subsistence) as well as the WUN (25k Rand).

### Functions at international meetings:

- 2<sup>nd</sup> DAEC Meeting on "The Distribution of Matter in the Universe", Observatoire de Paris-Meudon (F), March 1991; **SOC member**
- 4<sup>th</sup> DAEC Meeting on "Unveiling Large-Scale Structures behind the Milky Way", Observatoire de Paris-Meudon (F), January 1994: **Organizer and editor** with C. Balkowski
- Workshop on "HI in the Local Universe", Sydney (Au), May 1996: **Overseas coordinator and SOC member**
- Joint Discussion on "Redshift Surveys in the 21st Century", IAU General Assembly, Kyoto (J), August 1997: **SOC member**
- Meeting on "Recent Starformation in Nearby Early-Type Galaxies", Guanajuato (Mx), June/July 1998: **LOC member**
- "Large-Scale Structure and Galaxy Clusters", 4th Workshop of the "Guillermo Haro" International Program on Advanced Astrophysical Research, INAOE, Puebla (Mx), 15.6.-15.7.1999: **Co-organizer** with Dr. Omar López-Cruz and Dr. Howard K.C. Yee
- "Mexican School of Astrophysics", Guanajuato (Mx), 4.8.-11.8.1999: **Invited lecturer**
- "Reunión Anual de Astronomía", Guanajuato (Mx), November 1999: **LOC member**
- International Meeting on "Mapping the Hidden Universe: The Universe Behind the Milky Way – The Universe in HI", Guanajuato (Mx), 23.2.-29.2.2000: **Organizer and editor**
- International Meeting on "Billion Galaxy Surveys", Marseille (F), 25.6.-29.6.2001: **SOC member**
- International Meeting on "Nearby Large-Scale Structures and the Zone of Avoidance", Cape Town (RSA), 28.3.-2.4.2003: **Co-Chair of SOC**
- The NASSP/AIMS 2005 Student Workshop on "SALT Science", Muizenberg, 7.11.-11.11.2005: **Member of OC**
- International Meeting on "Panoramic Radio Astronomy: Wide-field 1-2 GHz research on galaxy evolution", 2-5 June 2009, Groningen, the Netherlands: **SOC member and co-host through UCT**
- "Beyond 2010", Fifth International Conference on Beyond the Standard Models of Particle Physics, Cosmology and Astrophysics, 1-6 February 2010, Cape Town, South Africa, **LOC member**
- "The spectral energy distribution of galaxies (SED2011)", IAU Symposium, 5-12 September 2011, University of Central Lancashire, UK, **SOC member**
- "Cosmic Flows - Observations and Simulations", June 3rd - 7th, 2013, Marseille, France **SOC member**
- "Cosmic Flows in Vietnam 2016", July 3rd - 9th, 2016, Vietnam **SOC member**

## Observations:

- About 20 nights at the 1m telescope on the Gornergrat (Switzerland) doing photoelectric three-colour photometry of stars (1980, 1982)
- About 50 nights at the 40 inch Swope telescope on Las Campanas (Chile) doing a systematic photographic survey to discover Supernovae (1984, 1985)
- One week at the 100m radio telescope in Effelsberg (Germany) to measure HI-radial velocities of galaxies (1988)
- Spectroscopic observations of galaxies at the 3.6m telescope at ESO, La Silla (Chile) using the multiobject fibersystems Optopus and Mefos (1991–1995)
- Observations with the Reticon spectrograph at the 1.9m telescope of the SAAO in Sutherland, South Africa (about 7 weeks between 1990–1995)
- After an initial 40 days test run for a feasibility study in 1992, the 25m radio telescope in Dwingeloo (The Netherlands) had been dedicated from May 1993 to May 1999 to our systematic blind HI-search for galaxies in the northern Galactic plane
- 4 extended periods of 10–13 full days each with the 64m radio telescope in Parkes (Australia) to detect LSB galaxies in the southern Milky Way (1993–1996)
- 1995–1997, various observing runs with the Nançay radio telescope (France) to map the local gas-rich dwarf population with pointed observations and in a contiguous way with drift-scan observations, as well as pointed ZOA observations
- 1997–2005, regular observing runs with the Multibeam receiver of the 64m Parkes radio telescope (Australia) to systematically uncover the gas-rich galaxy distribution in the most obscured part of the southern Milky Way
- 3 nights in 1997 at the 2.2m telescope of ESO, La Silla (Chile), using IRAC for infrared (H) photometry of obscured galaxies behind the Milky Way
- 6 nights in 1998 at the 2.2m Guillermo Haro telescope of Cananea Observatory (Mexico) using LFOSC to obtain B&R CCD photometry and spectroscopy of Abell cluster galaxies without prior redshift information
- June 1999, 4 days of observing with the Australian Compact Array (Narrabri, Australia) for follow-up observations of fully obscured galaxies detected in the blind HI ZOA Multibeam Survey at Parkes.
- April 2006, 10 nights using the Japanese IRSF at the 1.4 m telescope in Sutherland, South Africa for 2 deep surveys in the ZOA (the supermassive galaxy and the Norma Wall).
- April 2007, 10 nights using the Japanese Infrared Survey Facility at the 1.4 m telescope in Sutherland, South Africa for deep survey of the Great Attractor Wall.
- September 2007, 2009, 2012, 2013, 4 nights using the 1.9m Radcliffe Telescope in Sutherland, South Africa, partly as training session/fieldtrip of 3rd year undergraduate students of the course AST3003S. The spectroscopic observations had the aim of obtaining redshifts for galaxies in the ZOA as well as for galaxies in Abell clusters that had no previous redshift determinations.
- A proposal for observations with the highly competitive and prestigious mid infrared Spitzer

Space Telescope to observe the supermassive HI galaxy HIZOA J0836-43 (IRAC, MIPS, IRS) as well as a half degree imaging survey (IRAC) of its environment was successful: Observations were made in 2007 and the data form part of the PhD thesis of M.Cluver (in collaboration with Dr. T. Jarrett (IPAC, USA)).

- A further Spitzer proposal to observe the core of the Great Attractor hidden in the deepest obscuration layer of the ZOA in 2007 was also successful. Observations were obtained in 2008.
- PI of observations with the Nançay Radio Telescope (France) to observe the brightest 2MASS galaxies within the northern ZOA ( $\pm 10^\circ$ ) without redshift information;  $\sim 1500$  hrs between 2009 and 2013
- PI of systematic follow-up near-infrared imaging observations with the IRSF in Sutherland have been taken between 2009-2014 (about 15 weeks of observing time) for all galaxies detected with radio survey.
- PI of SALT MOS spectroscopy (2012, 2013, 2014) of high-density clusters of galaxies that are hidden deep in the ZOA
- PI of a major international project (454 hrs of observing time) has been approved with Westerbork (14 x 25m) radio telescope as a science and pilot project for ZOA survey science with SKA Pathfinders.
- PI of 6 nights of observing time at one of the most competitive telescopes, i.e. using the multi-object spectrograph (400 object per pointing) on the 4m AAT telescope in Australia (results are highly interesting, Nature paper in preparation)
- PI of international program to use the 100m-class Nançay Radio Telescope to obtain high-fidelity HI-linewidths to apply the by us optimised NIR TF relation for determination of cosmic flow fields in the Zone of Avoidance.

### **Major Discoveries:**

- Unveiling of the large nearby spiral galaxy Dwingeloo 1 behind the northern Milky Way by means of a systematic blind HI-survey
- Discovery of a massive rich cluster behind the southern Milky Way which seems to constitute the previously unidentified core of the Great Attractor.
- The mapping of 883 galaxies hidden behind the southern Milky Way by using the Parkes Radio Telescope (Staveley-Smith, Kraan-Korteweg et al) – published early 2016 after many years of data taking, reductions and analysis – received world-wide press coverage (more than 370 news items that we know of, in at least 50 countries) including many live radio and TV interviews.