Curriculum Vitae

Marten Henric van Kerkwijk

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A: Biographical Information

Personal

Born 8 April 1966 in Haarlem, The Netherlands.
Canadian & Dutch citizenship.

Education

1983–1988: Undergraduate, University of Amsterdam; 'doctoraal' (equivalent to MA, 'cum laude'), October 1988, on the basis of a thesis titled "Massive X-ray binaries, Observations of One and Theory on All," supervised by E. P. J. van den Heuvel (list of publications 1 and 2).

1988–1993: 'Assistent in Opleiding' (PhD student), University of Amsterdam; PhD, November 1993, on the basis of a thesis titled "The mass of Vela X-1, the nature of Cygnus X-3, the character of Be stars," supervised by J. van Paradijs (list of publications 5, 10, 11, 16, 18, 19, and 24).

Employment

Present

Professor, Department of Astronomy and Astrophysics and School of Graduate Studies.

History

1988–1993: 'Assistent in Opleiding' (PhD student), University of Amsterdam.
1993–1997: Research Fellow, California Institute of Technology.
1997–1998: Postdoctoral Research Associate, University of Cambridge, Institute of Astronomy.
1998–2001: 'Docent/Onderzoeker' (tenured assistant professor), Utrecht University.
2001–2002: 'Senior Docent/Onderzoeker' (associate professor), Utrecht University.
2003– : Professor, University of Toronto.

Visiting appointments

1991/06–07: Visiting student member, Inst. for Theoretical Physics (for "Neutron stars in binary systems").
2000/10–12: Visiting member, Inst. for Theoretical Physics (for "Spin and magnetism in young neutron stars").
2007/04–05: Short-term visitor, School of Natural Sciences, Inst. of Advanced Studies.
2009/10–2010/01: Visiting member, Kavli Institute for Astronomy & Astrophysics, Peking University.
2010/02–07: Moore Distinguished Scholar, Califoria Institute of Technology.

Honours

1993–1996: Hubble Fellow; Space Telescope Science Institute.
1998–2002: 'Akademieonderzoeker'; Royal Netherlands Academy of Arts and Sciences (KNAW).
2010 : Moore Distinguished Scholar; California Institute of Technology.
2013–2014: Guggenheim Fellowship.
2019–2021: Killam Research fellowhsip

Affiliations and activities

1990– : 'Nederlandse Astronomen Club' (NAC; Dutch astronomer's association)
2000– : International Astronomical Union (IAU)
2003– : Canadian Astronomical Society (CASCA)

B: Academic history

Research endeavours

I am interested generally in compact objects, stars and binaries, their structure, formation and evolution, and their use to infer fundamental physical properties. My research is based on observations, but includes interpretation, theory and numerical modelling as required. I generally try to make progress using key observations and/or physical considerations of individual, carefully selected objects. My focus over the last few years has been to try to use neutron stars to study high-density and high field-strength physics, in conditions out of reach of terrestrial experiment (and theory, as yet), and to solve associated astronomical puzzles. I have also become very interested in trying to understand what white-dwarf binaries lead to type Ia supernova explosions. I describe these two themes in turn.

Neutron stars

Much of my work focussed on detailed studies of neutron stars in and out of binaries. Outside of binaries, this concerned mostly the so-called isolated neutron stars, where (we think) we see thermal emission directly from the surface (with very strong magnetic fields leading to needle-shaped atoms and the presence of neutral hydrogen even at a million degrees!).

In binaries, I have been trying to use the companions to get a handle on the neutron star mass, with success both using the "black-widow pulsar" PSR B1957+20 and a pulsar in a short, relativistic binary with a low-mass white dwarf. I've also become very intrigued by the possibilities of pico-arcsec astrometry offered by pulsar scintellation, as uncovered by CITA colleage Ue-Li Pen. We have started to try to apply the same technique on pulsars in binaries; a prime target would be the black-widow pulsar mentioned above, for which the uncertainty in its current high mass is dominated by the uncertainty in the inclination, which we should be able to measure using scintellometry.

Exploding white dwarfs

Type Ia supernova explosions are associated with the nuclear disintegration of white dwarfs. It is not clear, however, what their progenitors are. Generally, it is thought that the explosions happen as white dwarfs are brought to approach their maximum possible mass, either by accretion from a normal star, or by a merger with another white dwarf. However, all known channels produce too few explosions. I am pursuing two possible resolutions. One is to look for systems hitherto not well constrained, in which accretion is so rapid that a dense wind ensues, and the other is to see whether explosions could happen even for mergers of white dwarfs with total mass below the maximum mass.

Research grants

2003: Univ. of Toronto (Connaught, Department, Fac. of Arts and Sciences), startup, 1 yr, CA$85,000.
2003: Natural Sciences and Engineering Research Council (NSERC), Discovery grant, 5 yr, CA$350,000.
2008: Natural Sciences and Engineering Research Council (NSERC), Discovery grant, 5 yr, CA$343,580.
2013: Guggenheim foundation, Guggenheim Fellowship, 1 yr, US$40,000.
2013: Natural Sciences and Engineering Research Council (NSERC), Discovery grant, 5 yr, CA$260,000.
2017: SOSCIP Consortium, TalentEdge Postdoctoral Fellowship, 2 yr, CA$115,000.
2018: Natural Sciences and Engineering Research Council (NSERC), Discovery grant, 5 yr, CA$305,000.
2018: Natural Sciences and Engineering Research Council (NSERC), Discovery accelerator grant, 3 yr, CA$120,000.
2018: SOSCIP Accelerator HQP grant, 4 months, CA$20,000.

C: Scholarly and professional work

Journals[⋆]

1. Van Kerkwijk, M.H., van Oijen, J.G.J., van den Heuvel, E.P.J., 1989, "Extended optical spectroscopy of the massive companion of 4U1907+09," A&A 209, 173–182
2. Waters, L.B.F.M., van Kerkwijk, M.H., 1989, "The relation between orbital and spin periods in massive X-ray binaries," A&A 223, 196–206
3. Baade, D., Schmutz, W., van Kerkwijk, M.H., 1990, "Short-term activity in the γ^2 Velorum system: the O-type supergiant is a nonradially pulsating star," A&A 240, 105–115
4. Wijers, R.A.M.J., van den Heuvel, E.P.J., van Kerkwijk, M.H., Bhattacharya, D., 1992, "Genesis of a pulsar's planets," Nature 355, 593
5. Van Kerkwijk, M.H., Charles, P.A., Geballe, T.R., King, D.L., Miley, G.K., Molnar, L.A., van den Heuvel, E.P.J., van der Klis, M., van Paradijs, J., 1992, "Infrared helium emission lines from Cygnus X-3 suggesting a Wolf-Rayet star companion," Nature 355, 703–705
6. Meurs, E.J.A., Piters, A.J.M., Pols, O.R., Waters, L.B.F.M., Coté, J., van Kerkwijk, M.H., van Paradijs, J., Burki, G., Taylor, A.R., de Martino, D., 1992, "ROSAT survey observations of OB and OBe stars," A&A 265, L41–L44
7. Augusteijn, T., van Kerkwijk, M.H., van Paradijs, J., 1992, "A $59^{\rm m}$ photometric period in the dwarf nova V485 Centauri," A&A 267, L55–L58
8. Vermeulen, R.C., Murdin, P.G., van den Heuvel, E.P.J., Fabrika, S.N., Wagner, R.M., Margon, B.H., Hutchings, J.B., Schilizzi, R.T., van Kerkwijk, M.H., van den Hoek, L.B., Ott, E., Angebault, L.P., Miley, G.K., D'Odorico, S., Borisov, N., 1992, "Monitoring of very rapid changes in the optical spectrum of SS 433 in May/June 1987," A&A 270, 204–222
9. Dougherty, S.M., Cramer, N., van Kerkwijk, M.H., Taylor, A.R., Waters, L.B.F.M., 1993, "Intrinsic IR colours of normal B-type stars using the Geneva visual and ESO IR photometric systems," A&A 273, 503–508
10. Coté, J., van Kerkwijk, M.H., 1993, "New Be stars and the Be star frequency," A&A 274, 870–876
11. Van Kerkwijk, M.H., 1993, "Spectroscopic and photometric variability of Cygnus X-3," A&A 276, L9–L12
12. Dougherty, S.M., Waters, L.B.F.M., Burki, G., Coté, J., Cramer, N., van Kerkwijk, M.H., Taylor, A.R., 1994, "Near-IR excess of Be stars," A&A 290, 609–622
13. Kulkarni, S.R., Matthews, K.Y., Neugebauer, G., Reid, I.N., van Kerkwijk, M.H., Vasisht, G., 1995, "Optical and infrared observations of SGR 1806−20," ApJ 440, L61–L64
14. Van Kerkwijk, M.H., Kulkarni, S.R., Matthews, K.Y., Neugebauer, G., 1995, "A luminous companion to SGR 1806−20," ApJ 444, L33–L35
15. Johnston, S., Walker, M.A., van Kerkwijk, M.H., Lyne, A.G., D'Amico, N., 1995, "A 1500 MHz survey of the Galactic centre for pulsars," MNRAS 274, L43–L45
16. Van Kerkwijk, M.H., Waters, L.B.F.M., Marlborough, J.M., 1995, "Hα emission and infrared excess in Be stars: probing the circumstellar disc," A&A 300, 259–268
17. Van Kerkwijk, M.H., Kulkarni, S.R., 1995, "Spectroscopy of the white-dwarf companions of PSR 0655+64 and 0820+02," ApJ 454, L141–L144
18. Van Kerkwijk, M.H., van Paradijs, J., Zuiderwijk, E.J., Hammerschlag-Hensberge, G., Kaper, L., Sterken, C.S., 1995, "Spectroscopy of HD 77581 and the mass of Vela X-1," A&A 303, 483–496
19. Van Kerkwijk, M.H., van Paradijs, J., Zuiderwijk, E.J., 1995, "On the masses of neutron stars," A&A 303, 497–501
20. Groenewegen, M.A.T., Oudmaijer, R.D., Goudfrooij, P., van den Hoek, L.B., van Kerkwijk, M.H., 1996, "On the nature of AFGL 2477," A&A 305, 475–480
21. Van Kerkwijk, M.H., Bergeron, P., Kulkarni, S.R., 1996, "The masses of the millisecond pulsar J1012+5307 and its white-dwarf companion," ApJ 467, L89–L92

[⋆] Publishers of the journals are:
A&A (Astronomy and Astrophysics): Springer Verlag, Heidelberg (before 2001); EDP Sciences, Les Ulis (after 2001);
AJ (Astronomical Journal): Univ. of Chicago Press, Chicago (before 2008); Institute of Physics Publishing, Bristol (after 2008);
ApJ (Astrophysical Journal): Univ. of Chicago Press, Chicago (before 2009); Institute of Physics Publishing, Bristol (after 2009);
MNRAS (Monthly Notices of the Royal Astronomical Society): Blackwell Science, Oxford;
Nature: McMillan Magazines, London;
Science: AAAS, Washington

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23. Ray, P.S., Thorsett, S.E., Jenet, F.A., van Kerkwijk, M.H., Kulkarni, S.R., Prince, T.A., Sandhu, J.S., Nice, D.J., 1996, "A survey for millisecond pulsars," ApJ 470, 1103–1110
24. Van Kerkwijk, M.H., Geballe, T.R., King, D.L., van den Heuvel, E.P.J., van der Klis, M., van Paradijs, J., 1996, "The Wolf-Rayet counterpart of Cygnus X-3," A&A 314, 521–540
25. Bandyopadhyay, R., Shahbaz, T., Charles, P.A., van Kerkwijk, M.H., Naylor, T., 1997, "Infrared spectroscopy of low-mass X-ray binaries," MNRAS 285, 718–724
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27. Chakrabarty, D., van Kerkwijk, M.H., Larkin, J.E., 1998, "Infrared spectroscopy of GX 1+4/V2116 Oph: evidence for a fast red giant wind?," ApJ 497, L39–L42
28. Van Kerkwijk, M.H., Chakrabarty, D., Pringle, J.E., Wijers, R.A.M.J., 1998, "Warped disks as a possible origin of torque reversals in accretion-powered pulsars," ApJ 499, L27–L30
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30. Kulkarni, S.R., van Kerkwijk, M.H., 1998, "Optical observations of the isolated neutron star RX J0720.4−3125," ApJ 507, L49–L53
31. Stappers, B.W., van Kerkwijk, M.H., Lane, B.F., Kulkarni, S.R., 1998, "The light curve of the companion to PSR J2051−0827," ApJ 510, L45–L48
32. Van Kerkwijk, M.H., Kulkarni, S.R., 1999, "A massive white dwarf companion to the eccentric binary pulsar system PSR B2303+46," ApJ 516, L25–L28
33. In 't Zand, J.J.M., Verbunt, F., Strohmayer, T.E., Bazzano, A., Cocchi, M., Heise, J., van Kerkwijk, M.H., Muller, J.M., Natalucci, L., Smith, M.J.S., Ubertini, P., 1999, "A new X-ray outburst in the globular cluster NGC 6440: SAX J1748.9−2021," A&A 345, 100–108
34. Van Kerkwijk, M.H., Kaspi, V.M., Klemola, A.R., Kulkarni, S.R., Lyne, A.G., Van Buren, D., 2000, "Optical observations of the binary pulsar system PSR B1718−19: implications for tidal circularization," ApJ 529, 428–434
35. Van Kerkwijk, M.H., Bell, J.F., Kaspi, V.M., Kulkarni, S.R., 2000, "The temperature and cooling age of the white-dwarf companion to the millisecond pulsar PSR B1855+09," ApJ 530, L37–L40
36. Van Kerkwijk, M.H., Clemens, J.C., Wu, Y., 2000, "Surface motion in the pulsating DA white dwarf G 29-38," MNRAS 314, 209–219
37. Clemens, J.C., van Kerkwijk, M.H., Wu, Y., 2000, "Mode identification from time resolved spectroscopy of the pulsating white dwarf G 29-38," MNRAS 314, 220–228
38. Hulleman, F., van Kerkwijk, M.H., Verbunt, F.W.M., Kulkarni, S.R., 2000, "A deep search for the optical counterpart to the anomalous X-ray pulsar 1E 2259+586," A&A 358, 605–611
39. Verbunt, F., van Kerkwijk, M.H., in 't Zand, J.J.M., Heise, J., 2000, "X-ray and optical follow-up observations of the August 1998 transient in NGC 6440," A&A 359, 960–966
40. Hulleman, F., van Kerkwijk, M.H., Kulkarni, S.R., 2000, "An optical counterpart to the anomalous X-ray pulsar 4U 0142+61," Nature 408, 689–692
41. Stappers, B.W., Van Kerkwijk, M.H., Bell, J.F., Kulkarni, S.R., 2001, "Intrinsic and reprocessed optical emission from the companion to PSR J2051−0827," ApJ 548, L183–L186
42. Kaplan, D.L., Kulkarni, S.R., van Kerkwijk, M.H., Rothschild, R.E., Lingenfelter, R.L., Marsden, D., Danner, R., Murakami, T., 2001, "HST observations of SGR 0526−66: new contraints on accretion and magnetar models," ApJ 556, 399–407
43. Augusteijn, T., Kuulkers, E., van Kerkwijk, M.H., 2001, "The IR counterpart of the black-hole candidate 4U 1630 − 47," A&A 375, 447–454
44. Barziv, O., Kaper, L., van Kerkwijk, M.H., Telting, J., van Paradijs, J., 2001, "The mass of the neutron star in Vela X-1," A&A 377, 925–944
45. Van Kerkwijk, M.H., Kulkarni, S.R., 2001, "Optical spectroscopy and photometry of the neutron star RX J1856.5−3754," A&A 378, 986–995

46. In 't Zand, J.J.M., van Kerkwijk, M.H., Pooley, D., Verbunt, F., Lewin, W.H.G., Wijnands, R., 2001, "Identification of the optical and quiescent counterparts to the bright X-ray transient in NGC 6440," ApJ 563, L41–L44
47. Hulleman, F., Tennant, A.F., van Kerkwijk, M.H., Kulkarni, S.R., Kouveliotou, C., Patel, S.K., 2001, "A possible faint near-infrared counterpart to the anomalous X-ray pulsar 1E 2259+58.6," ApJ 563, L49–L52
48. Van Kerkwijk, M.H., Kulkarni, S.R., 2001, "An unusual Hα nebula around the nearby neutron star RX J1856.5−3754," A&A 380, 221–237
49. Kuulkers, E., in 't Zand, J.J.M., van Kerkwijk, M.H., Cornelisse, R., Smith, D.A., Heise, J., Bazzano, A., Cocchi, M., Natalucci, L., Ubertini, P., 2002, "A half-a-day long thermonuclear X-ray burst from KS 1731−260," A&A 382, 503–512
50. Kaplan, D.L., Kulkarni, S.R., Frail, D.A., van Kerkwijk, M.H., 2002, "Deep radio, optical, and infrared observations of SGR 1900+14," ApJ 566, 378–386
51. Kaplan, D.L., Kulkarni, S.R., van Kerkwijk, M.H., Marshall, H.L., 2002, "X-ray timing of the enigmatic neutron star RX J0720.4−3125" ApJ 570, L79–L83
52. Kaplan, D.L., van Kerkwijk, M.H., Anderson, J., 2002, "The parallax and proper motion of RX J1856.5−3754 revisited," ApJ 571, 447–457
53. Kotak, R., van Kerkwijk, M.H., Clemens, J.C., 2002, "Time-resolved optical spectroscopy of the pulsating DA white dwarf HS 0507+0434B," A&A 388, 219–234
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55. Kaplan, D.L., Kulkarni, S.R., van Kerkwijk, M.H., 2002, "A probable optical counterpart for the isolated neutron star RX J1308.6+2127," ApJ 579, L29–L32
56. Orosz, J.A., van Kerkwijk, M.H., 2003, "The eclipsing millisecond pulsar PSR J1740−5340 and its red straggler companion," A&A 397, 237–247
57. Kotak, R., van Kerkwijk, M.H., Clemens, J.C., Koester, D., 2003, "A new look at the pulsating DB white dwarf GD 385: Line-of-sight velocity measurements and constraints on model atmospheres," A&A 397, 1043–1055
58. Kaplan, D.L., Kulkarni, S.R., van Kerkwijk, M.H., 2003, "The optical counterpart of the isolated neutron star RX J1605.3+3249," ApJ 588, L33–L36
59. Thompson, S.E., Clemens, J.C., van Kerkwijk, M.H., Koester, D., 2003, "High-resolution spectroscopy of the pulsating white dwarf G 29-38," ApJ 589, 921–930
60. Bassa, C.G., van Kerkwijk, M.H., Kulkarni, S.R., 2003, "Temperature and cooling age of the white dwarf companion of PSR J0218+4232," A&A 403, 1067–1075
61. Kaplan, D.L., van Kerkwijk, M.H., Marshall, H.L., Jacoby, B.A., Kulkarni, S.R., Frail, D.A., 2003, "The nearby neutron star RX J0720.4−3125 from radio to X-rays," ApJ 590, 1008–1019
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63. Bassa, C.G., Verbunt, F., van Kerkwijk, M.H., Homer, L., 2003, "Optical identification of the companion to PSR J1911-5958A, the pulsar binary in the outskirts of NGC 6752," A&A 409, L31–L34
64. Jacoby, B.A., Bailes, M., van Kerkwijk, M.H., Ord, S., Hotan, A., Kulkarni, S.R., Anderson, S.B., 2003, "PSR J1909−3744, a binary millisecond pulsar with a very small duty cycle," ApJ 599, L99–L102
65. Kotak, R., van Kerkwijk, M.H. , Clemens, J.C., 2004, "A puzzling periodicity in the pulsating DA white dwarf G 117-B15A," A&A 413, 301–308
66. Hulleman, F., van Kerkwijk, M.H., Kulkarni, S.R., 2004, "The Anomalous X-ray Pulsar 4U 0142+61: variability in the infrared and a spectral break in the optical," A&A 416, 1037–1045
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Popular/other

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157. Kulkarni, S.R., van Kerkwijk, M.H., 1996, "X-ray bursts puzzle theorists," Physics World, 9/5, 19–20 (Institute of Physics Publishing Ltd, Bristol, UK)
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160. Van Kerkwijk, M.H., 2005, "From white dwarfs to black holes: density scales of stars," IDEA&S 2/2, 37 (Arts & Science review, University of Toronto)
161. Kaper, L., van der Meer, A., van Kerkwijk, M.H., van den Heuvel, E.P.J., 2006, "Weighing the masses of neutron stars," ESO Messenger 126, 27–30

Invited lectures and reviews

Colloquia: 61 since Jan. 2000. Of these, 50 aimed at astronomers (CITA [twice], Groningen, Saclay, UoT [thrice], TAPIR/Caltech, ITP, UCSC, Berkeley, Stanford, UCSB, Columbia [thrice], Leiden [twice], USTC [Hefei, China], Cornell [twice], McGill, Amsterdam [thrice], Caltech [twice], Lund, UCLA, PUC [Santiago, Chile; twice], Melbourne, Penn State, MIT [thrice], UNC, ESO/Chile, IAS, Waterloo, KIAA [Beijing], NAOC [Beijing], Alberta, Jena, Bonn, Carnegie, Victoria, Belfast, Manchester) one at nuclear physicists (KVI/Groningen), and eleven at a broad physics audience (UCSB, McGill [twice], Tsinghua, UWM, Bishop's, Stockholm, Nijmegen, Yale, Guelph, Purdue, FAST [Guizho], IUCAA [Pune], NCRA [Pune]).

Invited reviews: Nine since Jan. 2000; on properties of neutron stars (Van Paradijs memorial symp., Amsterdam, 2000; KIAS-APCTP Int'l Symp. in Astro-Hadron Physics, Seoul, 2003; physics of extreme gravity stars, NORDITA, Stockholm, 2017), on anomalous X-ray pulsars (HEAD meeting, Honolulu, 2000), on pulsar, white-dwarf binaries (Aspen winter conference on astrophysics, Aspen, 2004), on thermal emission from neutron stars (Compact Stars in the Rockies, Banff, 2008), on SN Ia explosion mechanisms (Lorentz Centre workshop on observational signatures of SN Ia, Leiden, 2013), on white dwarf mergers and their diverse outcomes (physics of extreme gravity stars, NORDITA, Stockholm, 2017), and on scintillometry (Global Radio Scintillometry, Shanghai, 2018).

D: Teaching

Courses taught

AST221H1F: Undergraduate class "Stars and the solar system" (2006, 2007, 2008, 2012, 2017, using the design of Prof. Wu).

AST320H1S: Senior undergraduate class "Introduction to astrophysics" (2003, 2005–2007, 2009, 2014, 2015; complete redesign).

AST424H1: Senior undergraduate class "Introduction to Astronomical Research" (2011/12, 2018/19, new course).

AST425Y1: Supervision of "Research topics in Astronomy & Astrophysics" (2010/11, 2011/12, 2017/18, 2018/19, using the design of Prof. Rucinski).

AST101H1F: Introductory class for non-science majors "The Sun and its neighbours" (2003–2005, 2011; designed from scratch for Convocation Hall; team-taught with Profs Abraham and Netterfield in 2003 and 2004; with Prof. Jayawardhana in 2005; and with Prof. Reid in 2011).

AST201H1S: Introductory class for non-science majors "Stars and galaxies" (2004–2006, 2009; designed from scratch for Convocation Hall; team-taught with Profs Abraham and Netterfield in 2003 and 2004; with Prof. Jayawardhana in 2006; and with Prof. Mochnacki in 2009).

AST210H1F: Introductory class for science majors "Great Moments in Astronomy" (2010, complete redesign).

SCI199Y2: First-year undergraduate seminar class "Astronomy at the frontier" (2007, taught together with Prof. Wu).

AST1410H1S: Graduate course "Stars" (2013, 2019, loosely based on a previous design by Prof. Wu)

AST1500Y1: Supervision of "Directed Research" (2014, 2015, 2016; cosupervised with Prof. Abraham in 2014).

AST1501Y1: Supervision of "Introduction to Research" (2014/5, 2015/6).

AST3010H1S: Graduate course "Advanced topics in stellar astronomy: Transients" (2011, new course).

Mini-course on "Star and planet formation" (2005; designed from scratch; team-taught with seven others [organiser]).

Mini-course on "Statistics in astronomy" (2007, 2013; designed from scratch; taught together with Prof. Netterfield).

Mini-course on "Physics of transients" (2018, loosely based on my 2011 graduate course on transients).

Mini-course on "Transient observables" (2018, loosely based on my 2011 graduate course on transients).

Mini-course on "Code development" (2018, designed from scratch).

Before Jan. 2003 (at Utrecht University): senior undergraduate class "Structure and evolution of stars" (2000, 2001; complete redesign); part of an inter-university course on "Star and planet formation" (2002; designed from scratch). Received formal teaching qualification from Utrecht University in 2001.

Undergraduates (including summer students and research assistants)

2003–2004: C. D'Angelo, "The formation of contact binaries in hierarchical triple systems."[79] (AST425 research project, 2004 Summer student, research assistant)

2007–2009: S. Ossokine, "Guitar fever and a pulsar's speed" (research assistant, NSERC Summer student, AST425 research project).

2007–2008: A. Ingle, "Reconstructing the Guitar: blowing bubbles with a pulsar bow shock back flow"[96] (summer research assistant and AST 425 research project).

2010–2011: H. A. White, "Simmering and detonations in white dwarfs" (AST425 research project and Summer research assistant).

2011–2013: S. Byun, "White dwarf mergers" (AST425 research project and research assistant).

2011–2012: M. Lennox, "Stable Nickel as a Disciminant between SN Ia models" (AST424 literature research).

2012–2013: M. Patel, "Simulating Supernova Spectra" (work study position).

2012–2013: A. Fernando, "Common-envelope mergers of carbon-oxygen white dwarfs" (AST425 research project).

2013–2014: N. Fantin, "Modeling rapidly accreting white dwarfs" (AST425 research project, mostly supervised by graduate student Kelly Lepo).

2015: E. Deibert, "Crab giant pulses" (USRA, mostly supervised by graduate student R. Main).

2015: C. Peacock, "Understanding a very cool white-dwarf pulsar companion (USRA, mostly supervised by Dunlap fellow J. Antoniadis).

2015–2016: T. Serafin Nadeau, "Tidal dissipation effects on the shortest period detached white dwarf binary" (AST 425 reserch project).

2015–2016: K. Husain, "Determining the companion star in the V445 Puppis system" (AST 425 research project).

2016–2017: V. Sok, "Phase retrieval for pulsar dynamic spectra" (AST 425 research project).

2016–2017: W. Cashore, "Type Ia supernova subtype classifications" (AST 424 literature research project).

2017–2018: B. Howell, "Scintillation in the double-pulsar binary" (AST 425 research project).

2018–2019: C. El Khoury, "A search for giant pulses in PSR B1133+16" (AST 425 research project).

MSc Students and short PhD research projects

2001–2002: C.G. Bassa (Utrecht), "Temperature and cooling age of the white dwarf companion of PSR J0218+4232."[60]

2001–2004: T. Janssen (Utrecht), "Observations of the companion to the pulsar PSR B1718−19: the role of tidal circularisation."[74]

2003–2004: F. G. Peña, "The properties of the eclipsing millisecond pulsar PSR J1740−5340 and its red straggler companion." (AST1501 research project)

2004: M. Stankovic, "The formation of close binaries in triple systems." (AST1501 research project)

2005: D. Nguyen, "Measuring the dark matter halo around the elliptical galaxy NGC 4636" (AST1500 research

project, supervised jointly with Profs R. G. Abraham and S. Mochnacki).

2005–2006: D. Goncalves, "Testing white-dwarf models using the white-dwarf companion of the binary pulsar PSR J1909−3744" (AST1501 research project).

2005–2006: E. Mentuch, "Lithium depletion of young stellar associations"[99] (NSERC Summer and AST1501 research project, supervised jointly with Prof. R. Jayawardhana).

2007–2008: A. Rivera, "Dust scattering haloes around Anomalous X-ray Pulsars"[105] (AST1501 research project).

2008: J. Radigan, "The mass of the recurrent nova U Scorpii" (AST1500 research project).

2008–2009: K. Lepo, "A search for neutron stars companions to bright stars in the Rosat All-Sky Survey" (AST1501 research project).

2010–2011: C. Zhu, "White dwarf mergers"[123] (AST1501 research project).

2011–2013: E. Blais, "Properties of white dwarf binaries" (AST1501 research project).

2012: H. White, "Former Companions in LMC/SMC Supernova Remnants" (AST1500 research project).

2015: A. Rachkov, "Orbital motion of PSR B1957+20" (AST 1500 research project, co-supervised with U.-L. Pen).

2015–2016: C.Berard, "Investigating the progenitor system of SN 2006X" (AST 1501 research project).

2015–2016: N. Mahajan, "Cyclic spectroscopy on PSR B1957+20" (AST 1501 research project, co-supervised with U.-L. Pen).

2016–2017: R. McKinven, "Scintillometry on PSR B0329+54" (AST 1501 research project, co-supervised with U.-L. Pen).

2017–2018: T. Serafin Nadeau, "Crab giant pulse scattering" (AST 1501 research project).

2018–2019: A. Patil, "CHIME Monitoring of Pulsars and the Interstellar Medium towards them" (AST 1501 research project, co-supervised with C. Ng and U.-L. Pen)

PhD students

1998–2002: R. Kotak (Lund), "Inside pulsating white dwarfs: Clues from time-resolved spectroscopy."[53, 54, 57, 65]

1998–2003: F. Hulleman (Utrecht), "Anomalous X-ray pulsars at visible and infrared wavelengths."[38, 40, 47, 66]

2002–2006: M. Durant, "Magnetars: distances, variability and multi-wavelength observations."[70, 73, 81, 83, 84, 85]

2002–2006: C. G. Bassa (Utrecht), "Optical studies of compact binaries in globular clusters and the galactic disk."[63, 78, 80] (co-promotor; Prof. F. Verbunt of Utrecht Univ. was primary superviser).

2005–2009: D. Nguyen, "Probing Star Formation with High-Resolution Spectroscopy."[102, 103, 116] (co-supervised with Prof. Jayawardhana).

2009–2014: K. Lepo, "A search for SN Ia progenitors in the Magellanic Clouds."[126]

2011–2016: C. Zhu, "Illuminating Mergers of Carbon-Oxygen White Dwarfs and Their Possible Link to Thermonuclear Supernovae"[123, 131]

2014–2018: R. A. Main, "Resolving Pulsar Emission with Cosmic Microscopes"[133, 135, 142] (co-supervised with U.-L. Pen).

2015– : E. Heringer, type Ia supernovae.[134, 140]

2016– : N. Mahajan, scintillometry[138].

2017– : R. Lin, scintillometry.

2018– : T. Serafin-Nadeau, scintillometry (co-supervised with U.-L. Pen).

Postdoctoral fellows

1999–2002: J.A. Orosz (Utrecht), binary stars with compact objects.[56]

2004–2007: A. Brandeker, multiplicity among young stars.[82, 92, 93, 99, 97, 102, 103, 116]

2006–2007: K. Mori, isolated neutron stars.[86]

2007–2009: D. Lafrenière, multiplicity amoung young stars.[97, 100, 107, 129]

2008–2011: R. Breton, masses of neutron stars.[106, 112, 118, 125]

2012–2014: W. Kerzendorf, supernovae and their progenitors.[134]
2015–2018: I.-S. Yang, scintillometry[135] (primary superviser U.-L. Pen).
2016– : V. Marthi, scintillometry (primary superviser U.-L. Pen).
2017–2018: C. Zhu, SOSCIP Fellow, baseband data and scintillometry code development.
2017–2018: R. Archibald, NSERC Fellow, scintillometry (co-supervised with U.-L. Pen).
2018– : J. Luo, SOSCIP Fellow, baseband data and scintillometry code development.

Research assistants/associates

2003: F. Bao (Toronto), tertiary components to close binaries.
2018: B. Howell (Toronto), Scintillation in the double-pulsar binary.

E: Administration

University

1998–2002: Organiser, Astronomy Colloquium (Utrecht).
1999–2000: Member, physics & astronomy education committee (Utrecht).
2001: Member, committee for implementation of the Bachelor/Master structure (Utrecht).
2002–2003: Member, search committee new departmental faculty.
2002– : Member, computing committee.
2003–2006: Organiser, Astronomy Colloquium.
2003– : Member, undergraduate curriculum committee.
2003: Chair, future of the library committee.
2003–2004: Adviser, title selection for library acquisition.
2003–2004: Member, search committee new departmental faculty.
2004: Member, Helen Sawyer Hogg visitor committee.
2005: Member, search committee new departmental chair.
2005–2007: Member, awards committee.
2006–2008: Chair, one of two first-year PhD students committees.
2007–2008: Member, Helen Sawyer Hogg visitor committee.
2008: Member, one of two first-year PhD students committees.
2008–2009: Co-organiser, Astronomy Colloquium.
2010: Member, one of two first-year PhD students committees.
2010–2011: Member, search committee new departmental/Dunlap Institute faculty.
2011–2013: Associate Chair, Undergraduate.
2011: Member, search committee IT assistant.
2011: Member, search committee graduate chair assistant.
2012: Member, search committee IT assistant.
2012: Member, general qualifier committee.
2012–2013: Member, search committee new departmental/Dunlap Institute faculty.
2012–2013: Member, search committee new departmental/Dunlap Institute lecturer.
2012–2014: Member, Connaught physical sciences panel.
2013: Member, search committee departmental CLTA.
2013–2014: Member, search committee new departmental faculty.
2014–2015: Chair, Connaught physical sciences panel.
2014: Member, general qualifier committee.
2014: Member, search committee graduate assistant. 2014–2016: Associate Chair, Graduate.

2014–2015: Chair, one of three first-year PhD students committees.

2014–2015: Member, new building committee.

2015: Member, Dunlap Fellow selection committee.

2015–2016: Chair, general qualifier committee.

2018–2019: Associate Chair, Undergraduate.

Qualifying exams: 2002: P. Nair (2002); B. Lee (2003); M.L. McClure (2003); M. Durant (2003); J. Liska (2004); I.-H. Li (2004); H. Neilson (2005); D. N. Nguyen (2006); R. Fernandez (2006); S. Gonzales (2007); B. Croll (2008); L. Fissel (2008); G. Rivest (2008); K. Lepo (2010); N. Tacik (2011); S. Ro (2013); S. Janssens (2014); L. Esteves (2014); E. Meyer (2015); S.-L. Jing (2016 [twice]), A. Kostenko (2016), N. Price-Jones (2017), A. Bahmanyar (2018).

Thesis exams: R. H. M. Voors (1999, Utrecht); J. Vink (1999, Utrecht); J. I. van Gent (2000, Utrecht); P. Veen (2000, Leiden); M. van den Berg (2001, Utrecht); E. van den Swaluw (2001, Utrecht); W. A. Barkhouse (2003); S. E. Thompson (2004, UNC); C. Tycner (2004); H. Trac (2004); A. van der Meer (2006, Amsterdam); M. Durant (2006); C. G. Bassa (2006, Utrecht); B. Lee (2007); D. S. Davis (2008; external examiner); R. Fernandez (2009); H. Neilson (2009); B. Croll (2011); S. González (2011); K. Lepo (2014); C. Zhu (2016); N. Tacik (2016), S. Ro (2017), L. Esteves (2017).

Thesis committees: D. L. Kaplan (external adviser; 1998–2004, Caltech); S. E. Thompson (thesis committee and external adviser; 2002–2004); C. Bassa (external adviser & co-promotor; 2003–2006, Utrecht); B. Lee (2003–2007); A. van der Meer (2003–2006, Amsterdam); H. Neilson (from 2004); R. Fernandez (2005–2009); M. Ahmic (2007); B. Croll (2007–2011); L. Fissel (2008–2014); N. Tacik (2011–2016); S. Ro (2013–2017); L. Esteves (2014–2017), S.-L. Jing (from 2015); A. Kostenko (from 2016); A. Bahmanyar (from 2017), A. O'Grady (from 2017); N. Afsariardchi (from 2018); E. Deibert (from 2018); V. Chan (from 2019).

Wider community

Continuing: Regular referee for ApJ, AJ, A&A, MNRAS, Nature, Nature Astronomy, Science.

Continuing: Regular referee for NSERC discovery grant, and CFHT and Gemini observing proposals.

1996: Member, time allocation panel for binaries, Hubble Space Telescope, cycle 7.

1999–2002: Member, time allocation panel for stars, European Southern Observatory.

2000–2002: Member, review committee for astronomy of the Netherlands Org. for Scientific Research (NWO).

2000–2002: Member, time allocation committee of the Netherlands Foundation for Research in Astronomy (NFRA).

2000: Co-chair, Dutch Astronomer's Conference.

2001: Member, scientific organising committee "New Visions of the X-ray Universe."

2004–2006: Member, time allocation committee for CFHT and Gemini (CTAC).

2004–2006: Member, joint committee for space astronomy (JCSA).

2006–2007: Chair, joint committee for space astronomy (JCSA).

2004–2008: Deputy PI, Bright Target Explorer (BRITE; PI: A. Moffat, UdeM).

2004–2006: Member, Canadian High Energy Small Satellite planning team (PI: V. Kaspi).

2005: Member, scientific organising committee "Neutron stars at the cross-roads of fundamental physics" (August 9–13, 2005; chair J. Heyl, UBC).

2005–2006: Member, TMT-WFOS science team (PI: R. Abraham, UofT).

2006: Member, scientific advisory committee "Canadian Space Astronomy Workshop," November 23–24, 2006 (Chair R. Doyon, UdeM).

2006–2007: Member, scientific organising committee meeting "40 years of pulsars," August 12–17, 2007 (chair V. M. Kaspi, McGill).

2006–2007: Member, local organising committee "Multiplicity in Star Formation," May 16–18, 2007 (chair R. Jayawardhana, UofT).

2007–2009: Member, Discussion working group on high-energy astrophysics (PI: V. Kaspi).

2007–2008: Member, XEUS/HTRS science team.

2008: Co-chair, high-B session of Texas in Vancouver.
2008–2009: Member, local organising committee CASCA09, May 26–29, 2009 (Chair R. Jayawardhana, UofT).
2009–2012: IXO science team associate.
2009–2011: Member, An ASKAP survey for variables and slow transients (VAST).
2010–2011: Member, NuSTAR Galactic science team.
2010–2013: Member, Less is More project, aimed at building a series of mini-satellites.
2010–2011: Member, RoboAO science team.
2010: Member, XMM TAC Supernovae, Supernova Remnants, Diffuse (galactic) Emission and INS.
2012: Member, SOC, IAU Symp 291, Neutron Stars and Pulsars: Challenges and Opportunities after 80 years.
2014–2016: Member, GEONIS science team.
2014–2016: Member, CASCA mid-term review panel.

F: Other activities

Outreach: Part of 'Morgensterren,' a series of lectures for female high-school students (Utrecht 1998, 1999); part of class for retirees "Explosions in the Universe" (Utrecht, 2002); two interviews for spacecast.com by Natasha Eloi (2003); invited talk for the Royal Canadian Institute and Royal Astronomical Society of Canada (Toronto, 2003); appeared in UofT magazines IDEA&S and Edge (2005, 2006); invited lecture for RASC Niagara (2008); interviews for dutch newpapers and radio related to our discovery of a planetary mass companion to a young solar analog (2008); part of lectures for retirees at Glendon College (2011); interviewed on News Hour, Global TV Hamilton (2012); interviewed by CP24 for Venus transit (2012); UofT news article on Guggenheim fellowship (2013); UofT/FAS press release on Science article (2013).

Observing: Optical observations with telescopes on Calar Alto (1.2m, 2.2m), La Palma (WHT), La Silla (1m, CAT, ESO 1.5m, NTT, ESO 3.6m), Paranal (Antu), Mauna Kea (UKIRT, Keck, CFHT), Palomar Mountain (200″), Las Campanas (Magellan), and Richmond Hill (DDO). Pulsar searches with Arecibo and Parkes. VLBI/scintellation studies of pulsars with GMRT, LOFAR, Effelsberg, EVN, VLBA, Jodrell Bank, and Algonquin. Analysis of data from HST, IUE, EXOSAT, ROSAT, Chandra, and XMM.

Instrumentation planning: Bright target explorer BRITE (member science team; 2004–2008); Nuclear spectroscopic telescope array NuSTAR (member Canadian science team; 2004–2005; member Galactic science team 2010–2011); "Less is More" project of mini-satellites (2010–2012). Development of "scintellometry" (led by Ue-Li Pen, since 2013). Geonis science team (led by Nick Konidaris at Caltech, 2014–2016).

Open-source software development: Substantial contributions to the widely used ASTROPY project (fourth largest contributor of those currently active; commit access), in particular in bringing the parts dealing with time up to pulsar timing standards, and improving the parts dealing with quantities and tables. Smaller but significant contributions also to NUMPY, an extremely widely used python package (commit access granted, and on steering council since 2017). Development of a new BASEBAND package for dealing with raw radio baseband data, and a new SCINTILLOMETRY package for its analysis.

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