

# Stuart Wyithe

## List of Publications by Year in descending order

Source: <https://exaly.com/author-pdf/1416545/publications.pdf>

Version: 2024-02-01

129  
papers

7,800  
citations

44069

48  
h-index

53230

85  
g-index

130  
all docs

130  
docs citations

130  
times ranked

4776  
citing authors

#	ARTICLE	IF	CITATIONS
1	A new MWA limit on the 21Âcm power spectrum at redshifts $z \approx 13$ . Monthly Notices of the Royal Astronomical Society, 2021, 505, 4775-4790.	4.4	25
2	Constraining the 21Âcm brightness temperature of the IGM at $z = 6.6$ around LAEs with the Murchison widefield array. Monthly Notices of the Royal Astronomical Society, 2021, 507, 772-780.	4.4	3
3	Epoch of reionization power spectrum limits from Murchison Widefield Array data targeted at EoR1 field. Monthly Notices of the Royal Astronomical Society, 2021, 508, 5954-5971.	4.4	14
4	Deep multiredshift limits on Epoch of Reionization 21Âcm power spectra from four seasons of Murchison Widefield Array observations. Monthly Notices of the Royal Astronomical Society, 2020, 493, 4711-4727.	4.4	129
5	Limits to Rest-frame Ultraviolet Emission from Far-infrared-luminous $z \approx 6$ Quasar Hosts. Astrophysical Journal, 2020, 900, 21.	4.5	19
6	A Strong-lensing Model for the WDMF JWST/GTO Very Rich Cluster A1489. Astrophysical Journal, 2020, 903, 137.	4.5	4
7	Gridded and direct Epoch of Reionisation bispectrum estimates using the Murchison Widefield Array. Publications of the Astronomical Society of Australia, 2019, 36, .	3.4	19
8	Improving the Epoch of Reionization Power Spectrum Results from Murchison Widefield Array Season 1 Observations. Astrophysical Journal, 2019, 884, 1.	4.5	92
9	Robust statistics towards detection of the 21Âcm signal from the Epoch of Reionization. Monthly Notices of the Royal Astronomical Society, 2019, 486, 5766-5784.	4.4	4
10	First Season MWA Phase II Epoch of Reionization Power Spectrum Results at Redshift 7. Astrophysical Journal, 2019, 887, 141.	4.5	69
11	On the Observability of Individual Population III Stars and Their Stellar-mass Black Hole Accretion Disks through Cluster Caustic Transits. Astrophysical Journal, Supplement Series, 2018, 234, 41.	7.7	66
12	The SAMI Galaxy Survey: understanding observations of large-scale outflows at low redshift with EAGLE simulations. Monthly Notices of the Royal Astronomical Society, 2018, 473, 380-397.	4.4	9
13	The Phase II Murchison Widefield Array: Design overview. Publications of the Astronomical Society of Australia, 2018, 35, .	3.4	140
14	Assessment of Ionospheric Activity Tolerances for Epoch of Reionization Science with the Murchison Widefield Array. Astrophysical Journal, 2018, 867, 15.	4.5	17
15	Comparing Redundant and Sky-model-based Interferometric Calibration: A First Look with Phase II of the MWA. Astrophysical Journal, 2018, 863, 170.	4.5	41
16	Dark matter annihilation in the circumgalactic medium at high redshifts. Monthly Notices of the Royal Astronomical Society, 2018, 474, 3067-3079.	4.4	6
17	Spectral Energy Distribution and Radio Halo of NGC 253 at Low Radio Frequencies. Astrophysical Journal, 2017, 838, 68.	4.5	23
18	Detection of a possible superluminous supernova in the Epoch of Reionization. Science Bulletin, 2017, 62, 675-678.	9.0	2

#	ARTICLE	IF	CITATIONS
19	Simulated metal and H&#i absorption lines at the conclusion of reionization. Monthly Notices of the Royal Astronomical Society, 2017, 470, 2494-2509.	4.4	16
20	Theoretical study of an LAE&#i absorption pair at $z \sim 5.7$ . Monthly Notices of the Royal Astronomical Society: Letters, 2017, 469, L53-L57.	3.3	9
21	Convergence properties of halo merger trees; halo and substructure merger rates across cosmic history. Monthly Notices of the Royal Astronomical Society, 2017, 472, 3659-3682.	4.4	31
22	Determining the H&#i content of galaxies via intensity mapping cross-correlations. Monthly Notices of the Royal Astronomical Society, 2017, 470, 3220-3226.	4.4	42
23	The growth of discs and bulges during hierarchical galaxy formation &#i. II. Metallicity, stellar populations and dynamical evolution. Monthly Notices of the Royal Astronomical Society, 2017, 465, 4133-4146.	4.4	5
24	LOW-FREQUENCY OBSERVATIONS OF LINEARLY POLARIZED STRUCTURES IN THE INTERSTELLAR MEDIUM NEAR THE SOUTH GALACTIC POLE. Astrophysical Journal, 2016, 830, 38.	4.5	58
25	DELAY SPECTRUM WITH PHASE-TRACKING ARRAYS: EXTRACTING THE H&#i POWER SPECTRUM FROM THE EPOCH OF REIONIZATION. Astrophysical Journal, 2016, 833, 213.	4.5	15
26	The Relation between Star-Formation Rate and Stellar Mass of Galaxies at $z \sim 1$ . Publications of the Astronomical Society of Australia, 2016, 33, .	3.4	21
27	FIRST SEASON MWA EOR POWER SPECTRUM RESULTS AT REDSHIFT 7. Astrophysical Journal, 2016, 833, 102.	4.5	147
28	THE IMPORTANCE OF WIDE-FIELD FOREGROUND REMOVAL FOR 21 cm COSMOLOGY: A DEMONSTRATION WITH EARLY MWA EPOCH OF REIONIZATION OBSERVATIONS. Astrophysical Journal, 2016, 819, 8.	4.5	65
29	A high reliability survey of discrete Epoch of Reionization foreground sources in the MWA EoR field. Monthly Notices of the Royal Astronomical Society, 2016, 461, 4151-4175.	4.4	27
30	THE MURCHISON WIDEFIELD ARRAY 21 cm POWER SPECTRUM ANALYSIS METHODOLOGY. Astrophysical Journal, 2016, 825, 114.	4.5	67
31	First limits on the 21&#i power spectrum during the Epoch of X-ray heating. Monthly Notices of the Royal Astronomical Society, 2016, 460, 4320-4347.	4.4	79
32	Intensity mapping cross-correlations: connecting the largest scales to galaxy evolution. Monthly Notices of the Royal Astronomical Society, 2016, 458, 3399-3410.	4.4	28
33	The growth of discs and bulges during hierarchical galaxy formation &#i. I. Fast evolution versus secular processes. Monthly Notices of the Royal Astronomical Society, 2016, 459, 4109-4129.	4.4	47
34	Parametrizing Epoch of Reionization foregrounds: a deep survey of low-frequency point-source spectra with the Murchison Widefield Array. Monthly Notices of the Royal Astronomical Society, 2016, 458, 1057-1070.	4.4	68
35	CHIPS: THE COSMOLOGICAL H&#i POWER SPECTRUM ESTIMATOR. Astrophysical Journal, 2016, 818, 139.	4.5	98
36	The stellar mass function and star formation rate&#i stellar mass relation of galaxies at $z \sim 7$ . Monthly Notices of the Royal Astronomical Society, 2015, 448, 3001-3021.	4.4	19

#	ARTICLE	IF	CITATIONS
37	A spectroscopically confirmed $z \approx 1.327$ galaxy-scale deflector magnifying a $z \approx 4.8$ Lyman-break galaxy in the Brightest of Reionizing Galaxies survey. Monthly Notices of the Royal Astronomical Society, 2015, 453, 3069-3082.	4.4	1
38	The $H\alpha$ mass function as a probe of photoionization feedback on low-mass galaxy formation. Monthly Notices of the Royal Astronomical Society, 2015, 453, 2316-2326.	4.4	14
39	Dark matter annihilation in the first galaxy haloes. Monthly Notices of the Royal Astronomical Society, 2015, 451, 2840-2850.	4.4	15
40	CONFIRMATION OF WIDE-FIELD SIGNATURES IN REDSHIFTED 21 cm POWER SPECTRA. Astrophysical Journal Letters, 2015, 807, L28.	8.3	73
41	The impact of strong gravitational lensing on observed Lyman-break galaxy numbers at $4 \leq z \leq 8$ in the GOODS and the XDF blank fields. Monthly Notices of the Royal Astronomical Society, 2015, 450, 1224-1236.	4.4	26
42	Prospects for gravitational-wave detection and supermassive black hole astrophysics with pulsar timing arrays. Monthly Notices of the Royal Astronomical Society, 2015, 447, 2772-2783.	4.4	56
43	The Murchison Widefield Array Correlator. Publications of the Astronomical Society of Australia, 2015, 32, .	3.4	39
44	CORRECTING THE $z \approx 8$ GALAXY LUMINOSITY FUNCTION FOR GRAVITATIONAL LENSING MAGNIFICATION BIAS. Astrophysical Journal, 2015, 805, 79.	4.5	67
45	Gravitational waves from binary supermassive black holes missing in pulsar observations. Science, 2015, 349, 1522-1525.	12.6	386
46	FOREGROUNDS IN WIDE-FIELD REDSHIFTED 21 cm POWER SPECTRA. Astrophysical Journal, 2015, 804, 14.	4.5	122
47	Evolution in the escape fraction of ionizing photons and the decline in strong Ly $\alpha$ emission from $z > 6$ galaxies. Monthly Notices of the Royal Astronomical Society, 2014, 440, 3309-3316.	4.4	67
48	A predicted new population of UV-faint galaxies at $z \approx 3-4$ . Monthly Notices of the Royal Astronomical Society, 2014, 439, 1326-1336.	4.4	19
49	Binary supermassive black hole environments diminish the gravitational wave signal in the pulsar timing band. Monthly Notices of the Royal Astronomical Society, 2014, 442, 56-68.	4.4	70
50	Simulated star formation rate functions at $z \approx 4-7$ , and the role of feedback in high- $z$ galaxies. Monthly Notices of the Royal Astronomical Society, 2014, 438, 3490-3506.	4.4	27
51	MEASUREMENT OF GALAXY CLUSTERING AT $z \approx 7.2$ AND THE EVOLUTION OF GALAXY BIAS FROM 3.8 <math>z</math> 8 IN THE XDF, GOODS-S, AND GOODS-N. Astrophysical Journal, 2014, 793, 17.	4.5	76
52	A survey for transients and variables with the Murchison Widefield Array 32-tile prototype at 154 MHz. Monthly Notices of the Royal Astronomical Society, 2014, 438, 352-367.	4.4	54
53	The Murchison Widefield Array: The Square Kilometre Array Precursor at Low Radio Frequencies. Publications of the Astronomical Society of Australia, 2013, 30, .	3.4	892
54	The EoR sensitivity of the Murchison Widefield Array. Monthly Notices of the Royal Astronomical Society: Letters, 2013, 429, L5-L9.	3.3	62

#	ARTICLE	IF	CITATIONS
55	On the role of feedback in shaping the cosmic abundance and clustering of neutral atomic hydrogen in galaxies. <i>Monthly Notices of the Royal Astronomical Society</i> , 2013, 428, 3366-3374.	4.4	17
56	A suppressed contribution of low-mass galaxies to reionization due to supernova feedback. <i>Monthly Notices of the Royal Astronomical Society</i> , 2013, 428, 2741-2754.	4.4	38
57	The giant lobes of Centaurus A observed at 118 MHz with the Murchison Widefield Array. <i>Monthly Notices of the Royal Astronomical Society</i> , 2013, 436, 1286-1301.	4.4	19
58	LOW-FREQUENCY OBSERVATIONS OF THE MOON WITH THE MURCHISON WIDEFIELD ARRAY. <i>Astronomical Journal</i> , 2013, 145, 23.	4.7	31
59	A 189 MHz, 2400 deg <sup>2</sup> POLARIZATION SURVEY WITH THE MURCHISON WIDEFIELD ARRAY 32-ELEMENT PROTOTYPE. <i>Astrophysical Journal</i> , 2013, 771, 105.	4.5	79
60	ON THE DETECTION AND TRACKING OF SPACE DEBRIS USING THE MURCHISON WIDEFIELD ARRAY. I. SIMULATIONS AND TEST OBSERVATIONS DEMONSTRATE FEASIBILITY. <i>Astronomical Journal</i> , 2013, 146, 103.	4.7	34
61	Gravitational-Wave Limits from Pulsar Timing Constrain Supermassive Black Hole Evolution. <i>Science</i> , 2013, 342, 334-337.	12.6	133
62	The Murchison Widefield Array: solar science with the low frequency SKA Precursor. <i>Journal of Physics: Conference Series</i> , 2013, 440, 012033.	0.4	15
63	Photon trapping enables super-Eddington growth of black hole seeds in galaxies at high redshift. <i>Monthly Notices of the Royal Astronomical Society</i> , 2012, 425, 2892-2902.	4.4	37
64	DOES A "STOCHASTIC" BACKGROUND OF GRAVITATIONAL WAVES EXIST IN THE PULSAR TIMING BAND?. <i>Astrophysical Journal</i> , 2012, 761, 84.	4.5	67
65	FAST HOLOGRAPHIC DECONVOLUTION: A NEW TECHNIQUE FOR PRECISION RADIO INTERFEROMETRY. <i>Astrophysical Journal</i> , 2012, 759, 17.	4.5	76
66	A new layout optimization technique for interferometric arrays, applied to the Murchison Widefield Array. <i>Monthly Notices of the Royal Astronomical Society</i> , 2012, 425, 1781-1788.	4.4	20
67	Near-infrared observations of Type Ia supernovae: the best known standard candle for cosmology. <i>Monthly Notices of the Royal Astronomical Society</i> , 2012, 425, 1007-1012.	4.4	64
68	A MICROLENSING MEASUREMENT OF DARK MATTER FRACTIONS IN THREE LENSING GALAXIES. <i>Astrophysical Journal</i> , 2011, 731, 71.	4.5	39
69	Subtraction of Bright Point Sources from Synthesis Images of the Epoch of Reionization. <i>Publications of the Astronomical Society of Australia</i> , 2011, 28, 46-57.	3.4	24
70	THE SHOCKING TRUTH: THE SMALL CONTRIBUTION TO HYDROGEN REIONIZATION FROM GRAVITATIONAL INFALL. <i>Astrophysical Journal</i> , 2011, 743, 173.	4.5	3
71	Subtraction of point sources from interferometric radio images through an algebraic forward modelling scheme. <i>Monthly Notices of the Royal Astronomical Society</i> , 2011, 413, 411-422.	4.4	30
72	Determining the escape fraction of ionizing photons during reionization with the GRB-derived star formation rate. <i>Monthly Notices of the Royal Astronomical Society</i> , 2010, 401, 2561-2571.	4.4	33

#	ARTICLE	IF	CITATIONS
73	Cosmological constraints from 21cm surveys after reionization. Journal of Cosmology and Astroparticle Physics, 2009, 2009, 030-030.	5.4	41
74	The impact of $\tau$ in galaxies on 21-cm intensity fluctuations during the reionization epoch. Monthly Notices of the Royal Astronomical Society, 2009, 395, 311-318.	4.4	6
75	Evidence for merger-driven activity in the clustering of high-redshift quasars. Monthly Notices of the Royal Astronomical Society, 2009, 395, 1607-1619.	4.4	18
76	Modification of the 21-cm power spectrum by X-rays during the epoch of reionization. Monthly Notices of the Royal Astronomical Society, 2009, 396, 1106-1118.	4.4	11
77	The 21-cm power spectrum after reionization. Monthly Notices of the Royal Astronomical Society, 2009, 397, 1926-1934.	4.4	48
78	Fluctuations in 21-cm emission after reionization. Monthly Notices of the Royal Astronomical Society, 2008, 383, 606-614.	4.4	68
79	A microlensing study of the accretion disc in the quasar MG 0414+0534 <sup>...</sup> . Monthly Notices of the Royal Astronomical Society, 2008, 391, 1955-1960.	4.4	74
80	Possibility of Precise Measurement of the Cosmological Power Spectrum with a Dedicated Survey of 21cm Emission after Reionization. Physical Review Letters, 2008, 100, 161301.	7.8	139
81	Avalanche Dynamics of Radio Pulsar Glitches. Astrophysical Journal, 2008, 672, 1103-1118.	4.5	141
82	A Search for Hi21 cm Absorption toward the Highest Redshift ( $z \sim 5.2$ ) Radio-loud Objects. Astronomical Journal, 2007, 133, 2841-2845.	4.7	23
83	Constraining the quasar contribution to the reionization of cosmic hydrogen. Monthly Notices of the Royal Astronomical Society, 2007, 374, 627-633.	4.4	35
84	Smooth boundaries to cosmological H II regions from galaxy clustering. Monthly Notices of the Royal Astronomical Society, 2007, 374, 960-964.	4.4	12
85	The correlation between the distribution of galaxies and 21-cm emission at high redshifts. Monthly Notices of the Royal Astronomical Society, 2007, 375, 1034-1042.	4.4	42
86	The impact of The IGM on high-redshift Ly $\alpha$ emission lines. Monthly Notices of the Royal Astronomical Society, 2007, 377, 1175-1186.	4.4	144
87	Luminosity functions of Ly $\alpha$ emitting galaxies and cosmic reionization of hydrogen. Monthly Notices of the Royal Astronomical Society, 2007, 379, 253-259.	4.4	97
88	Very massive stars in high-redshift galaxies. Monthly Notices of the Royal Astronomical Society, 2007, 379, 1589-1598.	4.4	43
89	Biased reionization and non-Gaussianity in redshifted 21-cm intensity maps of the reionization epoch. Monthly Notices of the Royal Astronomical Society, 2007, 379, 1647-1657.	4.4	53
90	Smooth matter and source size in microlensing simulations of gravitationally lensed quasars. Monthly Notices of the Royal Astronomical Society, 2007, 381, 1591-1596.	4.4	21

#	ARTICLE	IF	CITATIONS
91	The imprint of cosmic reionization on galaxy clustering. Monthly Notices of the Royal Astronomical Society, 2007, 382, 921-936.	4.4	12
92	Cosmic Variance in the Transparency of the Intergalactic Medium after Reionization. Astrophysical Journal, 2006, 646, 696-702.	4.5	18
93	What does the quasar luminosity function tell us about supermassive black hole evolution?. Monthly Notices of the Royal Astronomical Society, 2006, 372, 1681-1691.	4.4	10
94	Suppression of dwarf galaxy formation by cosmic reionization. Nature, 2006, 441, 322-324.	27.8	46
95	Calibrating the Galaxy Halo-Black Hole Relation Based on the Clustering of Quasars. Astrophysical Journal, 2005, 621, 95-103.	4.5	29
96	Constraints on the Process that Regulates the Growth of Supermassive Black Holes Based on the Intrinsic Scatter in the $M_{\text{BH}}-\sigma_{\text{BH}}$ Relation. Astrophysical Journal, 2005, 634, 910-920.	4.5	33
97	Undetected Sources Allow Transmission of the Ly $\alpha$ Line from Galaxies Prior to Reionization. Astrophysical Journal, 2005, 625, 1-5.	4.5	57
98	Prospects for Redshifted 21 cm Observations of Quasar H II Regions. Astrophysical Journal, 2005, 634, 715-727.	4.5	55
99	Improved Constraints on the Neutral Intergalactic Hydrogen Surrounding Quasars at Redshifts $z > 6$ . Astrophysical Journal, 2005, 628, 575-582.	4.5	72
100	Realistic event rates for detection of supermassive black hole coalescence by LISA. Monthly Notices of the Royal Astronomical Society, 2005, 361, 1145-1152.	4.4	39
101	The shallow slope of the $z \sim 6$ quasar luminosity function: limits from the lack of multiple-image gravitational lenses. Monthly Notices of the Royal Astronomical Society, 2004, 351, 1266-1276.	4.4	11
102	A large neutral fraction of cosmic hydrogen a billion years after the Big Bang. Nature, 2004, 427, 815-817.	27.8	116
103	A characteristic size of $\sim 10$ Mpc for the ionized bubbles at the end of cosmic reionization. Nature, 2004, 432, 194-196.	27.8	99
104	Detection of Gravitational Waves from the Coalescence of Population III Remnants with Advanced LIGO. Astrophysical Journal, 2004, 612, 597-601.	4.5	14
105	Redshifted 21 Centimeter Signatures around the Highest Redshift Quasars. Astrophysical Journal, 2004, 610, 117-127.	4.5	45
106	Low-Frequency Gravitational Waves from Massive Black Hole Binaries: Predictions for LISA and Pulsar Timing Arrays. Astrophysical Journal, 2003, 590, 691-706.	4.5	260
107	Was the Universe Reionized by Massive Metal-free Stars?. Astrophysical Journal, 2003, 588, L69-L72.	4.5	143
108	Reionization of Hydrogen and Helium by Early Stars and Quasars. Astrophysical Journal, 2003, 586, 693-708.	4.5	229

#	ARTICLE	IF	CITATIONS
109	Self-regulated Growth of Supermassive Black Holes in Galaxies as the Origin of the Optical and X-Ray Luminosity Functions of Quasars. <i>Astrophysical Journal</i> , 2003, 595, 614-623.	4.5	366
110	A Physical Model for the Luminosity Function of High-Redshift Quasars. <i>Astrophysical Journal</i> , 2002, 581, 886-894.	4.5	129
111	Photometric Solutions for Semidetached Eclipsing Binaries: Selection of Distance Indicators in the Small Magellanic Cloud. <i>Astrophysical Journal</i> , 2002, 571, 293-319.	4.5	44
112	Cosmological Microlensing Statistics: Variability Rates for Quasars and Gamma-Ray Burst Afterglows and Implications for Macrolensing Magnification Bias and Flux Ratios. <i>Astrophysical Journal</i> , 2002, 575, 650-666.	4.5	18
113	Constraints on the mass profile of the lens galaxy G2237+0305. <i>Monthly Notices of the Royal Astronomical Society</i> , 2002, 330, 575-582.	4.4	3
114	The size of the mid-IR emission region of a quasar inferred from microlensed images of Q2237+0305. <i>Monthly Notices of the Royal Astronomical Society</i> , 2002, 331, 1041-1052.	4.4	28
115	On the Probability Distribution of Cosmological Microlensing Optical Depths. <i>Astrophysical Journal</i> , 2002, 567, 18-30.	4.5	14
116	Measuring the Size of Quasar Broad-Line Clouds through Time-Delay Light-Curve Anomalies of Gravitational Lenses. <i>Astrophysical Journal</i> , 2002, 577, 615-625.	4.5	19
117	Gravitational Lensing of the Sloan Digital Sky Survey High-Redshift Quasars. <i>Astrophysical Journal</i> , 2002, 577, 57-68.	4.5	55
118	Mid-Infrared Imaging of the Einstein Cross QSO. <i>Publications of the Astronomical Society of Australia</i> , 2001, 18, 166-168.	3.4	5
119	Photometric Solutions for Detached Eclipsing Binaries: Selection of Ideal Distance Indicators in the Small Magellanic Cloud. <i>Astrophysical Journal</i> , 2001, 559, 260-274.	4.5	47
120	Determining the microlens mass function from quasar microlensing statistics. <i>Monthly Notices of the Royal Astronomical Society</i> , 2001, 320, 21-30.	4.4	45
121	Gravitational Lens Statistics for Generalized NFW Profiles: Parameter Degeneracy and Implications for Self-Interacting Cold Dark Matter. <i>Astrophysical Journal</i> , 2001, 555, 504-523.	4.5	106
122	Limits on the microlens mass function of Q2237+0305. <i>Monthly Notices of the Royal Astronomical Society</i> , 2000, 315, 51-61.	4.4	43
123	A gravitational microlensing determination of continuum source size in Q2237+0305. <i>Monthly Notices of the Royal Astronomical Society</i> , 2000, 315, 62-68.	4.4	50
124	Interpretation of the OGLE Q2237+0305 microlensing light curve (1997-1999). <i>Monthly Notices of the Royal Astronomical Society</i> , 2000, 318, 1120-1130.	4.4	16
125	A small source in Q2237+0305?. <i>Monthly Notices of the Royal Astronomical Society</i> , 2000, 318, 762-768.	4.4	45
126	Application of the contouring method to extended microlensed sources. <i>Monthly Notices of the Royal Astronomical Society</i> , 1999, 306, 223-231.	4.4	20



#	ARTICLE	IF	CITATIONS
127	A measurement of the transverse velocity of Q2237+0305. Monthly Notices of the Royal Astronomical Society, 1999, 309, 261-272.	4.4	46
128	The correlation between star formation and 21-cm emission during the reionization epoch. Monthly Notices of the Royal Astronomical Society, 0, 380, 1087-1097.	4.4	5
129	Constraining reionization using 21-cm observations in combination with CMB and Ly $\alpha$ forest data. Monthly Notices of the Royal Astronomical Society, 0, 408, 57-70.	4.4	39