Monitoring of SN explosions at Maidanak Observatory

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UBAI

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6th Maidanak Users Meeting

INTENSIVE MONITORING SURVEY OF NEARBY GALAXIES (IMSNG)

Name [AGN type] (1)	RA (J2000) (2)	Dec (J2000) (3)	D_L (Mpc) (4)	NUV (AB) (5)	Past SNe (6)
NGC 289	00:52:42.348	−31:12:20.92	24.0	-18.77	
NGC 337 [LIN]	00:59:50.100	−07:34:41.45	23.0	-18.64	1998dn, 2011dq, 2014cx
NGC 488	01:21:46.836	+05:15:24.48	38.0	-18.88	1976G, 2010eb
NGC 895	02:21:36.468	−05:31:17.00	37.0	-19.02	2003id
NGC 1097 [LIN]	02:46:19.092	−30:16:29.89	14.0	-18.55	1992bd, 1999eu, 2003B
NGC 1309	03:22:06.600	−15:24:00.07	29.0	-19.04	2002fk, 2012Z
NGC 1365 [S1.5]	03:33:36.396	−36:08:25.84	18.0	-19.33	1957C, 1983V, 2001du, 2012fr
UGC 2855	03:48:20.736	+70:07:58.30	14.0	-18.75	2014dg
NGC 1672 [S2]	04:45:42.516	−59:14:50.42	19.0	-19.34	2017gax
NGC 2207/IC 2163[a]	06:16:22.044	−21:22:21.76	38.0	-20.32	1975A, 1999ec, 2003H, 2010jp, 2013ai,
NGC 2336 [S2]	07:27:04.068	+80:10:41.02	29.0	-18.83	1987L
NGC 2442 [LIN]	07:36:23.796	−69:31:50.70	21.0	-19.20	1999ga, 2015F
NGC 2775	09:10:20.100	+07:02:17.23	43.0	-18.69	1993Z
NGC 2776	09:12:14.508	+44:57:17.53	41.0	-19.34	
NGC 2782 [oLLAGN]	09:14:05.064	+40:06:49.57	41.0	-18.76	1994ak
NGC 2993/2992 [S2][a]	09:45:48.312	−14:22:06.17	34.0	-18.85	2003ao, AT2017ejx
IC 2537	10:03:51.876	−27:34:14.81	36.0	-18.40	2010lm
NGC 3147 [S2]	10:16:53.688	+73:24:02.63	40.0	-19.29	1972H, 1997bq, 2006gi, 2008fv
NGC 3169 [LIN]	10:14:14.892	+03:27:58.86	45.0	-19.25	1984E, 2003cg
NGC 3183	10:21:48.960	+74:10:37.16	49.0	-18.56	
NGC 3244	10:25:28.848	−39:49:39.00	38.0	-18.63	2010ev
NGC 3294	10:36:16.236	+37:19:28.63	30.0	-18.43	1990H, 1992G
NGC 3344	10:43:31.116	+24:55:19.74	20.0	-19.42	2012fh
NGC 3367 [S2]	10:46:35.004	+13:45:02.09	45.0	-19.84	1986A, 1992C, 2003aa, 2007am, 2018k
NGC 3359	10:46:36.840	+63:13:26.83	23.0	-19.07	1985H
NGC 3445	10:54:35.712	+56:59:23.32	33.0	-18.55	
NGC 3629	11:20:31.776	+26:57:47.84	38.0	-18.55	
NGC 3646	11:21:43.092	+20:10:11.10	44.0	-19.47	1989N, 1999cd
NGC 3938	11:52:49.368	+44:07:14.88	19.0	-18.87	1961L, 1964L, 2005ay, 2017ein
NGC 4030	12:00:23.580	−01:06:00.00	27.0	-19.11	2007aa
NGC 4038 (Arp 244)	12:01:53.004	−18:52:04.76	21.0	-19.40	1921A, 1974E, 2004gt, 2007sr,
NGC 4039 (Arp 244)	12:01:53.616	−18:53:11.11	21.0	-19.39	
NGC 4108	12:06:44.316	+67:09:46.12	41.0	-18.50	ASASSN-15lf
NGC 4254 (M 99) [LIN]	12:18:49.572	+14:24:59.08	16.0	-19.03	1967H, 1972Q, 1986I, 2014L
NGC 4303 (M 61) [S2]	12:21:54.936	+04:28:27.05	18.0	-19.54	1926A, 1961I, 1964F, 1999gn, 2
NGC 4314 [LIN]	12:22:31.980	+29:53:43.48	44.0	-18.46	1954A
NGC 4321 (M 100) [LIN]	12:22:54.768	+15:49:18.80	14.0	-18.65	2006X
NGC 4500	12:31:22.152	+57:57:52.81	48.0	-18.47	
NGC 4653	12:43:50.916	−00:33:40.54	39.0	-18.66	1999gk, 2009ik
NGC 4814	12:55:21.936	+58:20:38.80	40.0	-18.53	
NGC5194 [S2]/5195[a] (M51)	13:29:52.692	+47:11:42.54	8.4	-19.03	1945A[b], 1994I, 2005cs, 2011dh
NGC 5236 (M83)	13:37:00.876	−29:51:56.02	4.9	-18.82	1923A, 1945B, 1950B, 1957D, 1
NGC 5371 [LIN]	13:55:39.936	+40:27:41.90	33.0	-19.09	1994Y
NGC 5430	14:00:45.720	+59:19:42.24	47.0	-18.70	PTF10acbu (PSN)
NGC 5457 (M101)	14:03:12.600	+54:20:56.62	6.9	-19.36	1909A, 1951H, 1970G, 2011fe
NGC 5584	14:22:23.772	−00:23:15.32	25.0	-18.43	1996aq, 2007af
NGC 5668	14:33:24.300	+04:27:01.19	25.0	-18.72	1952G, 1954B, 2004G
NGC 5850 [LIN]	15:07:07.644	+01:32:40.74	38.0	-18.65	1987B
NGC 5962	15:36:31.680	+16:36:28.15	30.0	-18.68	2016afa, 2017ivu
NGC 6070	16:09:58.680	+00:42:34.31	27.0	-18.58	
NGC 6555	18:07:49.188	+17:36:17.53	35.0	-18.54	
ESO 182-G10[c]	18:18:30.600	−54:41:39.41	49.0	-19.00	2006ci
NGC 6744 [LIN]	19:09:45.900	−63:51:27.72	9.3	-19.05	2005at
NGC 6814 [S1.5]	19:42:40.608	−10:19:25.32	23.0	-18.61	
NGC 6946[c, d]	20:34:52.572	+60:09:13.57	6.1	-19.12	1980K, 2002hh, 2004et, 2008S,
NGC 6951 [S2]	20:37:14.088	+66:06:20.45	25.0	-18.66	1999el, 2000E, 2015G
NGC 7083	21:35:44.592	−63:54:09.79	34.0	-18.98	1983Y, 2009hm
NGC 7479 [S2]	23:04:56.676	+12:19:22.12	30.0	-18.96	1990U, 2009jf
NGC 7552	23:16:10.776	−42:35:03.41	29.0	-18.84	2017bzc
NGC 7714/7715[a]	23:36:14.112	+02:09:18.07	41.0	-19.18	1999dn, 2007fo

(1) Galaxy name. The name in the parenthesis is another notable name of the galaxy, and the AGN types in the
(Seyfert), LIN (LINER), and oLLAGN; (2) and (3): Equatorial coordinates in J2000; (4) the luminosity dist
magnitude in AB mag; (6) the past SNe in the galaxy.
[a] Galaxies in pair, the primary NUV-selected galaxy number is given first; [b] In NGC5195; [c] Low Galactic
object had five additional SNe before 1980: ...

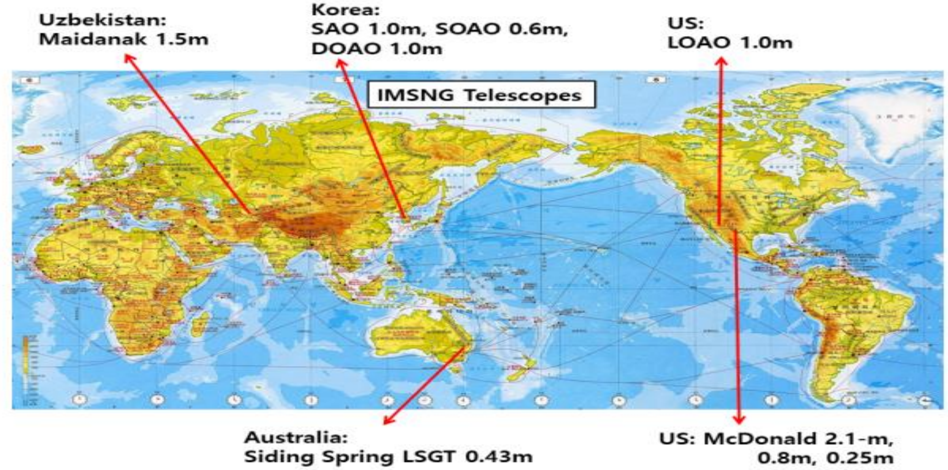
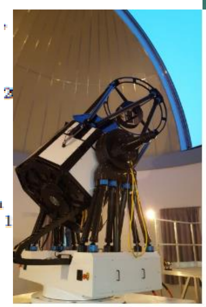


Figure 3. The locations of the telescopes used by IMSNG. The background world map is taken from http://trip8.co.

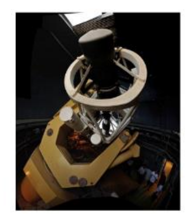


A new 1m telescope has been installed at Seoul National University Observatory

SOAO 0.61m telescope

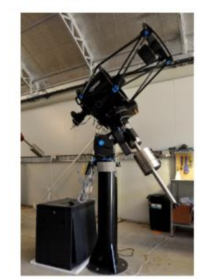
Sobaeksan Optical Astronomy Observatory is located on top of Mt.

Maidanak Observatory



Maidanak Observatory is located at Maydanak, Uzbekistan.

Lee Sang Gak Telescope

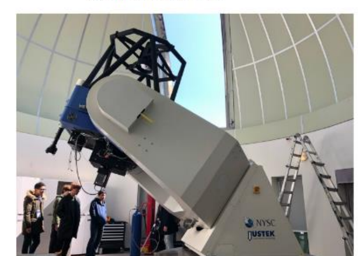


Mt.Lemmon Optical Astronomy Observatory

Mt. Lemmon Optical Astronomy Observatory is located at

McDonald Observatory

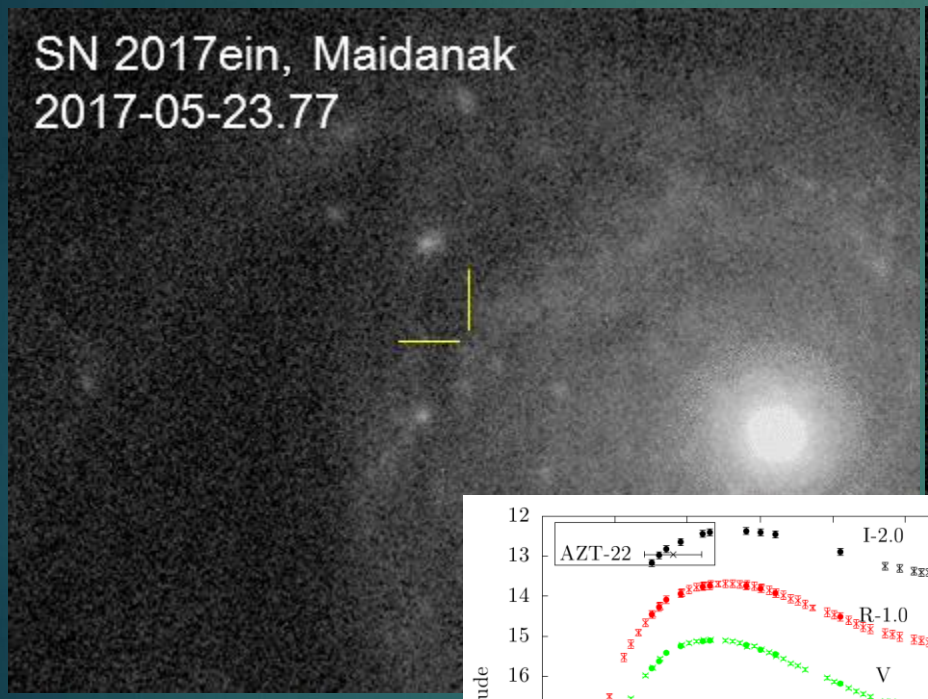
Dukheung Astronomy Observatory

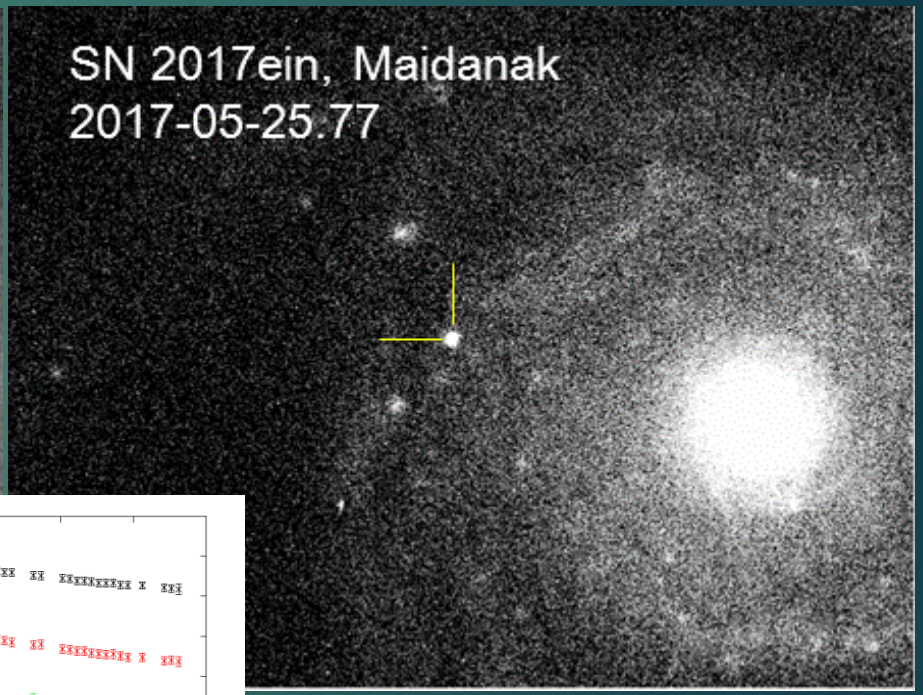


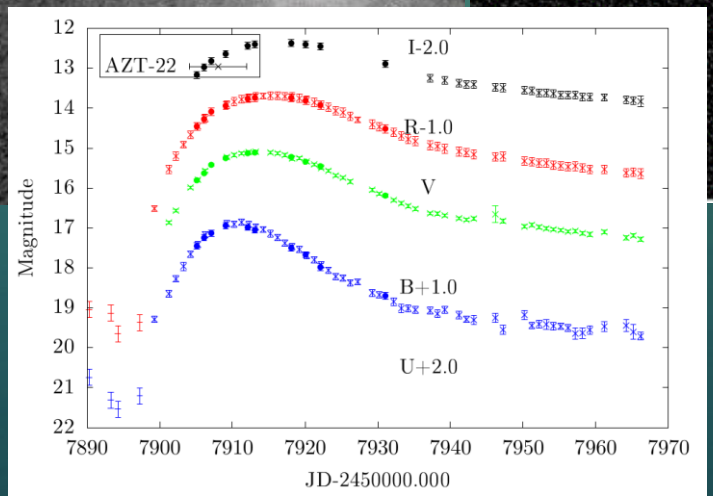
See Prof. Myungshin Im's presentation tomorrow for the details information

SN 2017ein

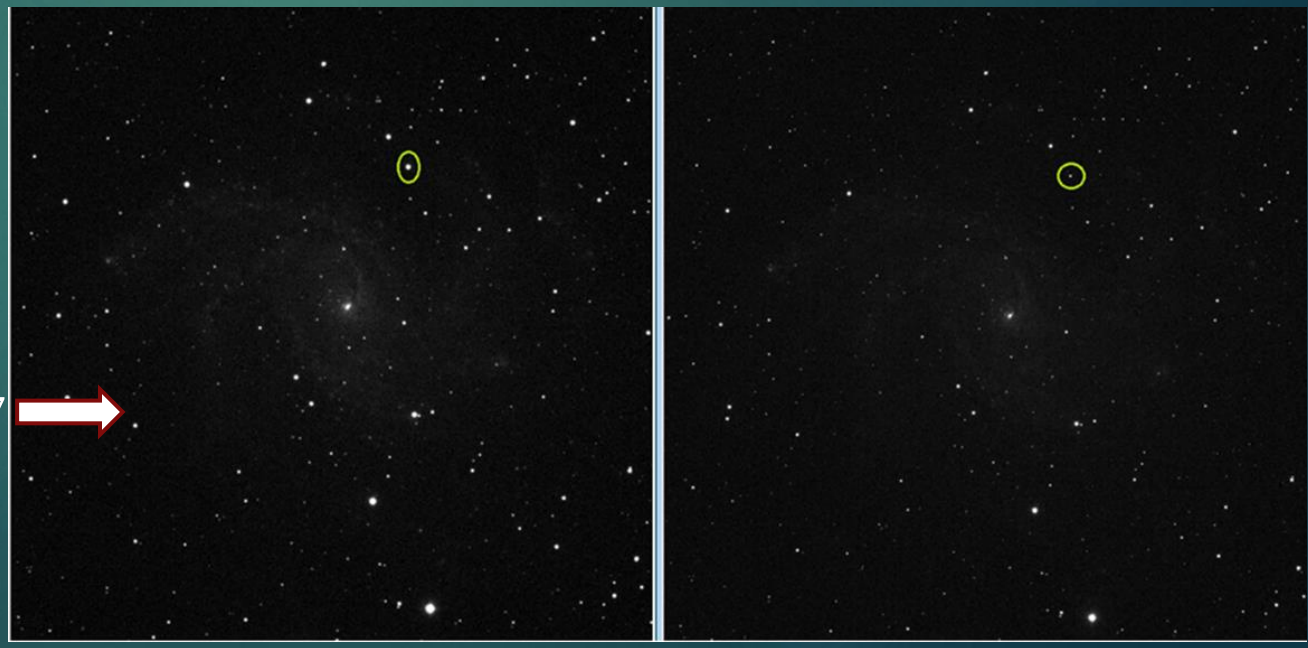
The supernova SN 2017ein was discovered by Ron Arbour on UTC 23:46 May 25, 2017, in the nearby galaxy NGC 3938. The object was observed (pre-discovery) on UTC 18:29 May 25 at Maidanak observatory







NGC6946 – SN2017eaw.
Patrick Wiggins (USA). 2017/05/14



16.05.2017 & 28.10.2017

Tsinghua University 2017

Monitong Supernovae in 2017-2021 at the Maidanak Observatory

№	SN	Discovery Date
1.	SN 2017egm	2017-05-25
2.	SN 2017faf	2017-06-28
3.	SN 2017eaw	2017-05-14
4.	SN 2017ein	2017-05-25
5.	SN 2017erp	2017-06-13
6.	SN 2018cow	2018-06-17
7.	SN 2018bek	2018-05-05
8.	SN 2018hti	2018-11-03
9.	ASASN-18ey	2018/03/11
10.	SN 2019ein	2019-05-01
11.	AT2020yxz	2020-11-05
12.	SN2020jfo	2020-05-06
13.	AT 2020ddy	2020-02-23
14.	SN2020oi	2020-01-07
15.	SN 2021qvv	2021-06-23
16.	SN2021hpr	2021-04-02
17.	SN2021jag	2021-04-11
18.	AT2021dgs	2021-02-16

Telscope - 1.5 m AZT-22

18 SN

More than 2500 frames

During period 2017-2021About 700 observation nights

see Gu Lim's presentation tomorrow

AT 2018cow

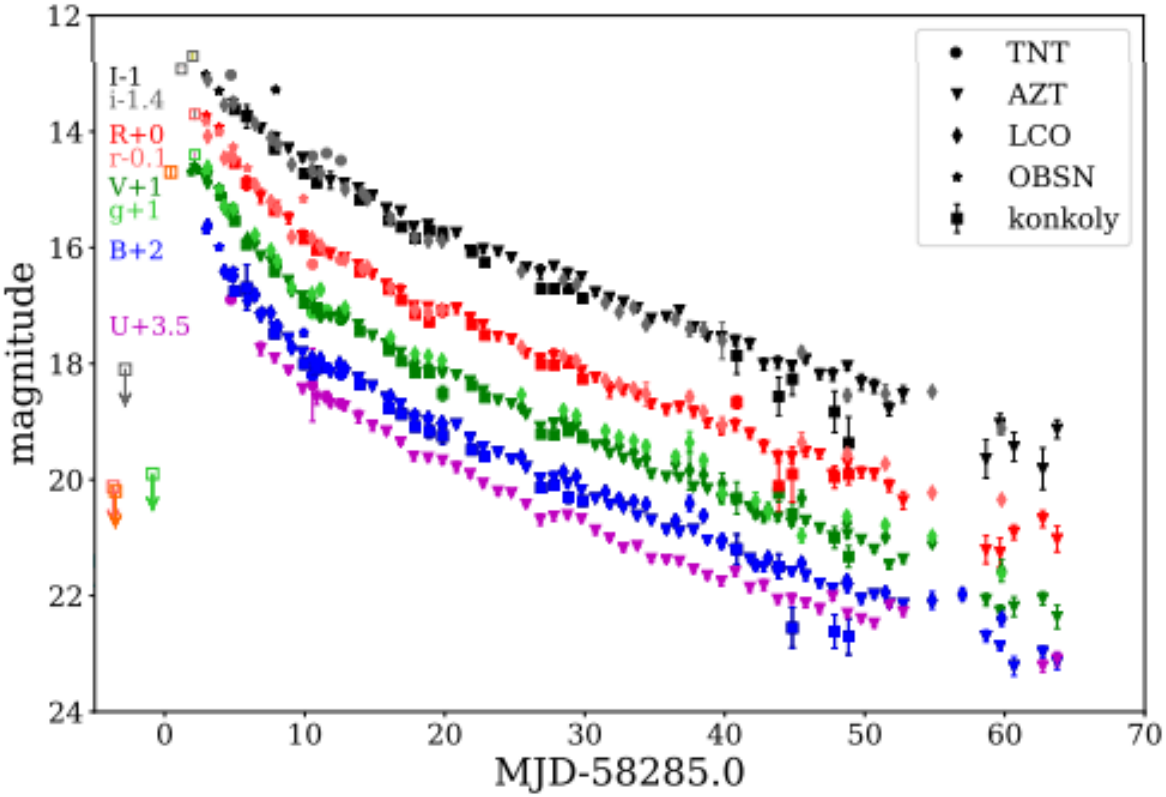
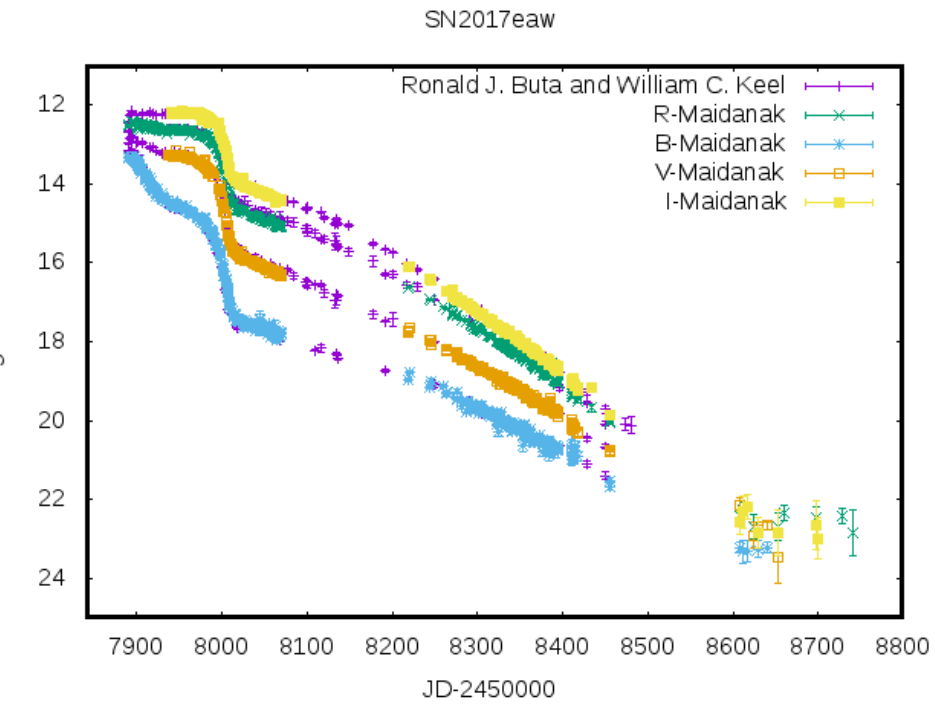


Figure 1. Light curves obtained from various telescopes.

see Danfeng Xiang's presentation tomorrow

SN 2017eaw



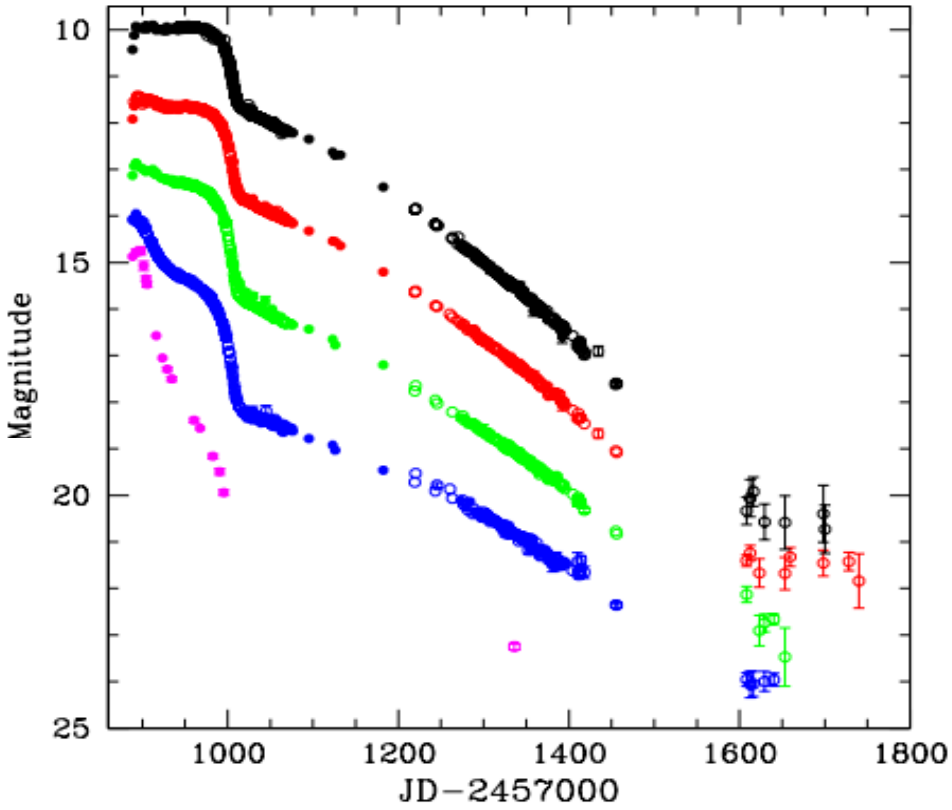


Рис. 1: Кривые блеска SN 2017eaw

"The Light curve of SN2017eaw" **(paper in prep.)**

Publications

№	Supernova	Total number of observations days	Filtr	Collaboration	Journal	Year
1	ASASSN-18ey	15	BV	Tsinghua University	MNRAS (in press)	2021
2	AT2018cow	50 (70)	BVRI	Tsinghua University	The Astrophysical Journal	2021
3	SN 2017eaw	234 (3г.)	BVRI	Sternberg Astronomical Institute Moscow University	ПАЖ (in prep)	2021
4	SN 2018hti	10	BVRI	Tsinghua University	MNRAS	2020
5	SN2017ein	66 (180)	BVRI	Tsinghua University	The Astrophysical Journal	2019
6	SN 2017erp	20 (60)	BVRI	Tsinghua University	The Astrophysical Journal	2019
7	IMSNG	2017-2020.	BVRI	Seoul National University	JKAS	2019
8	SN2017ein	52	BVRI	P.S. Tadjimuratov	Physical Sciences and Technology	2017
9	AT2019npv	Tsinghua University			GRB Coordinates Network, Circular, No. 25485	2019
10	SN 2017ein	Seoul National University			The Astronomer's Telegram, No. 10481	2017

Publivations

Hanna Sai, Xiaofeng Wang, Jianfeng Wu, Jie Lin, Tianmeng Zhang, Wenxiong Li, Jujia Zhang, Jun Mo, Tianrui Sun, Shuhrat A. Ehgamberdiev, **Davron Mirzaqulov**,"Optical and Ultraviolet Monitoring of the Black Hole X-ray Binary MAXI J1820+070/ASASSN-18ey for 18 Months" **Monthly Notices of the Royal Astronomical Society, Volume 504, Issue 3, July 2021, Pages 4226–4241, https://doi.org/10.1093/mnras/stab1162**

Xiang, Danfeng; Wang, Xiaofeng; Lin, Weili ..., Ehgamberdiev, Shuhrat A.; **Mirzaqulov, Davron** et al. "The Peculiar Transient AT2018cow: A Possible Origin of a Type Ibn/IIn Supernova" The Astrophysical Journal, March 2021, Volume 910, Issue 1, id.42, 12 pp.

W. Lin, X. Wang, W.Li, J. Zhang, J. Mo, H. Sai, X. Zhang, A.Filippenko, W. Zheng, T. Brink, E. Baron, J. DerKacy, S. Ehgamberdiev, **D. Mirzaqulov** et al. "SN 2018hti: A Nearby Superluminous Supernova Discovered in a Metal-poor Galaxy" Monthly Notices of the Royal Astronomical Society, July 2020. Volume 497, Issue 1, pp.318-335

Peter J. Brown, Griffin Hosseinzadeh, Saurabh W. Jha, David Sand, Ethan Vieira, Xiaofeng Wang, …, **Davron Mirzaqulov** et al. "Red And Reddened: Ultraviolet Through Near-Infrared Observations of Type Ia Supernova 2017erp ∗" // ***The Astrophysical Journal, Volume 877, Issue 2, article id. 152, 13 pp. (2019)***

Danfeng Xiang, Xiaofeng Wang, Jun Mo, Lingjun Wang, Stephen Smartt, Morgan Fraser, .., Shuhrat A. Ehgamberdiev, **Davron Mirzaqulov**, et al. "Observations of SN 2017ein Reveal Shock Breakout Emission and A Massive Progenitor Star for a Type Ic Supernova" // The Astrophysical Journal, Volume 871, Issue 2, article id. 176, 20 pp. (2019). (IF=5.533)

Myungshin Im, Changsu Choi, …, Shuhrat ehgamberdiev, Otabek Burkhonov, **Davron Mirzaqulov** et al. Intensive Monitoring Survey of Nearby Galaxies (IMSNG) // Jurnal of the Korean Astronomical Society, 2019, Journal of the Korean Astronomical Society, vol. 52, no. 1, pp. 11-21

Astronomer's Telegram

1. Im, M., Choi, Ch., Lee.S, Lim Gu, Hwang S., Mirzaqulov D.O. Ehgamberdiev Sh.A. et al."IMSNG: Light curve analysis suggests SN 2017ein as a young SN at the time of the discovery" // The Astronomer's Telegram, No. 10481. 10/06/2017

Thank you for your attention!