

В этом файле Iridiums_ISS_Sheltozero.pdf собрана полная информация о всех вспышках спутников Иридиум, всех полётах МКС (Международной космической станции) и других ярких спутниках, которые можно будет наблюдать во время Пятой Карельской астрономической экспедиции с 11 по 21 августа 2013 года.

Этот файл Iridiums_ISS_Sheltozero.pdf удобно напечатать на принтере и распечатку взять с собой в Шёлтозеро.

Для получения данных была использована ссылка:

<http://www.heavens-above.com/?lat=61.4043&lng=35.3434&loc=Unspecified&alt=0&tz=RFTm3>

(то есть в поисковую систему введены координаты базы ПетрГУ в Шёлтозере 61.4043°N, 35.3434°E).

Часть 1. МКС (Международная космическая станция)

ISS - Visible Passes

Search period start: 11 August 2013 00:00

Search period end: 21 August 2013 00:00



Orbit: 414 x 419 km, 51.6° (Epoch: 01 August)

Passes to include: visible only visible/night all

~~UPDATED~~ Click on the date to get a star chart and other pass details.

Date	Brightness [Mag]	Start			Highest point			End			Pass type
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.	
11 Aug	-1.2	00:31:26	10°	SW	00:32:47	14°	SSW	00:32:47	14°	SSW	Visible
11 Aug	-1.4	23:42:51	10°	SW	23:44:55	15°	S	23:45:46	14°	S	Visible
12 Aug	-1.4	22:54:22	10°	SW	22:56:31	16°	S	22:58:40	10°	SE	Visible
13 Aug	-0.8	00:31:22	10°	SW	00:31:36	10°	SW	00:31:36	10°	SW	Visible
13 Aug	-1.2	23:42:20	10°	SW	23:43:55	13°	SSW	23:44:34	12°	S	Visible
14 Aug	-1.2	22:53:36	10°	SW	22:55:30	14°	SSW	22:57:25	10°	SSE	Visible
16 Aug	-0.9	22:53:20	10°	SW	22:54:25	11°	SSW	22:55:29	10°	S	Visible

Часть 2. Спутники Иридиум.

Time	Brightness	Altitude	Azimuth	Satellite	Distance to flare centre	Brightness at flare centre	Sun altitude
Aug 11, 23:15:49	-4.4	37°	29° (NNE)	Iridium 94	12 km (W)	-7.4	-8° 🌙
Aug 11, 23:16:47	-0.5	39°	29° (NNE)	Iridium 23	36 km (W)	-7.4	-8° 🌙
Aug 12, 03:09:18	-1.1	30°	317° (NW)	Iridium 32	36 km (W)	-7.1	-12° 🌙
Aug 12, 04:37:59	-0.4	65°	281° (W)	Iridium 97	32 km (E)	-8.4	-6° 🌙
Aug 12, 23:09:54	-7.5	39°	31° (NNE)	Iridium 45	0 km (W)	-7.5	-8° 🌙
Aug 13, 03:03:12	-3.6	30°	317° (NW)	Iridium 58	17 km (E)	-7.1	-12° 🌙
Aug 14, 02:56:53	-0.2	29°	319° (NW)	Iridium 55	50 km (E)	-7.0	-13° 🌙
Aug 14, 04:16:25	-0.4	51°	295° (WNW)	Iridium 96	36 km (W)	-8.1	-8° 🌙
Aug 15, 02:59:40	-2.9	25°	321° (NW)	Iridium 30	21 km (W)	-6.7	-13° 🌙
Aug 15, 04:28:49	-2.3	57°	284° (WNW)	Iridium 35	19 km (W)	-8.3	-8° 🌙

Search period start: 11:15 Thursday, 15 August, 2013

Search period end: 11:15 Thursday, 22 August, 2013



include daytime flares

Clicking on the time of the flare will give more details about the flare, including a sky chart.

Time	Brightness	Altitude	Azimuth	Satellite	Distance to flare centre	Brightness at flare centre	Sun altitude
Aug 16, 02:53:35	-2.0	25°	322° (NW)	Iridium 57	30 km (E)	-6.7	-14° 🌙
Aug 16, 04:22:45	-3.3	58°	286° (WNW)	Iridium 6	15 km (E)	-8.3	-9° 🌙
Aug 17, 02:56:10	-0.5	21°	325° (NW)	Iridium 55	46 km (W)	-6.4	-14° 🌙
Aug 17, 22:49:07	-4.4	46°	38° (NE)	Iridium 11	11 km (W)	-7.8	-8° 🌙
Aug 18, 02:50:02	-5.6	20°	326° (NW)	Iridium 31	12 km (E)	-6.4	-14° 🌙
Aug 18, 22:43:04	-3.7	46°	40° (NE)	Iridium 94	12 km (E)	-7.8	-8° 🌙
Aug 18, 22:44:02	-3.8	48°	40° (NE)	Iridium 23	13 km (W)	-7.9	-8° 🌙
Aug 19, 02:52:43	-0.3	17°	329° (NNW)	Iridium 57	51 km (W)	-6.1	-14° 🌙
Aug 19, 04:13:34	-2.6	52°	289° (WNW)	Iridium 5	18 km (W)	-8.1	-10° 🌙
Aug 19, 04:13:39	-0.4	51°	289° (WNW)	Iridium 4	37 km (W)	-8.1	-10° 🌙
Aug 19, 22:37:07	-2.0	47°	42° (NE)	Iridium 45	21 km (E)	-7.9	-8° 🌙
Aug 20, 02:46:33	-6.0	16°	331° (NNW)	Iridium 60	2 km (E)	-6.0	-15° 🌙
Aug 20, 04:07:25	-8.1	51°	291° (WNW)	Iridium 8	2 km (E)	-8.1	-11° 🌙
Aug 21, 02:48:51	-0.4	12°	334° (NNW)	Iridium 31	49 km (W)	-5.7	-15° 🌙
Aug 21, 04:01:21	-0.6	52°	292° (WNW)	Iridium 61	36 km (E)	-8.1	-12° 🌙
Aug 21, 23:48:33	-3.2	12°	7° (N)	Iridium 59	16 km (W)	-5.5	-13° 🌙
Aug 22, 02:42:51	-3.0	13°	335° (NNW)	Iridium 91	22 km (E)	-5.7	-16° 🌙

Часть 3. Спутник Envisat

Envisat - Visible Passes

Search period start: 11 August 2013 00:00



Search period end: 21 August 2013 00:00

Orbit: 765 x 767 km, 98.4° (Epoch: 31 July)

Passes to include: visible only visible/night all

~~UPDATED~~ Click on the date to get a star chart and other pass details.

Date	Brightness [Mag]	Start			Highest point			End			Pass type
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.	
11 Aug	3.4	22:58:48	10°	S	23:03:50	64°	WSW	23:08:56	10°	NNW	Visible
12 Aug	5.3	00:40:45	10°	WSW	00:43:54	16°	W	00:47:03	10°	NW	Visible
13 Aug	4.7	00:02:39	10°	SSW	00:06:56	27°	W	00:11:14	10°	NNW	Visible
13 Aug	3.9	23:25:17	10°	S	23:30:09	44°	W	23:35:02	10°	NNW	Visible
14 Aug	5.6	01:09:14	10°	W	01:10:33	11°	WNW	01:11:51	10°	WNW	Visible
14 Aug	3.2	22:48:27	10°	SSE	22:53:32	74°	WSW	22:58:39	10°	NNW	Visible
15 Aug	5.2	00:29:54	10°	SW	00:33:27	19°	W	00:37:00	10°	NW	Visible
15 Aug	4.5	23:52:03	10°	SSW	23:56:32	31°	W	00:01:03	10°	NNW	Visible
16 Aug	3.7	23:14:51	10°	S	23:19:48	51°	W	23:24:47	10°	NNW	Visible
17 Aug	5.4	00:57:48	10°	WSW	01:00:04	13°	WNW	01:02:19	10°	NW	Visible
17 Aug	3.1	22:38:08	10°	SSE	22:43:13	85°	WSW	22:48:21	10°	NNW	Visible
18 Aug	5.0	00:19:08	10°	SW	00:23:01	22°	W	00:26:54	10°	NW	Visible
18 Aug	4.3	23:41:30	10°	SSW	23:46:09	35°	W	23:50:50	10°	NNW	Visible
19 Aug	3.5	23:04:26	10°	S	23:09:28	59°	WSW	23:14:31	10°	NNW	Visible
20 Aug	5.4	00:46:43	10°	WSW	00:49:35	15°	W	00:52:28	10°	NW	Visible
20 Aug	3.0	22:27:50	10°	SSE	22:32:56	85°	ENE	22:38:04	10°	NNW	Visible

Часть 4. Северокорейский спутник

N. Korean satellite - Visible Passes

Search period start: 11 August 2013 00:00



Search period end: 21 August 2013 00:00

Orbit: 494 x 576 km, 97.4° (Epoch: 31 July)

Passes to include: visible only visible/night all

~~UPDATED~~ Click on the date to get a star chart and other pass details.

Date	Brightness [Mag]	Start			Highest point			End			Pass type
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.	
15 Aug	?	23:18:29	10°	W	23:19:07	10°	W	23:19:46	10°	WNW	Visible
16 Aug	?	23:08:34	10°	WSW	23:10:07	12°	W	23:11:41	10°	WNW	Visible
17 Aug	?	22:59:03	10°	WSW	23:01:07	14°	W	23:03:12	10°	NW	Visible
18 Aug	?	22:49:41	10°	SW	22:52:07	17°	W	22:54:35	10°	NW	Visible
19 Aug	?	22:40:25	10°	SW	22:43:08	20°	W	22:45:54	10°	NW	Visible
20 Aug	?	22:31:12	10°	SW	22:34:09	23°	W	22:37:10	10°	NW	Visible

Часть 5. Космический корабль GENESIS I

Genesis I - Visible Passes

Search period start: 11 August 2013 00:00

Search period end: 21 August 2013 00:00



Orbit: 539 x 544 km, 64.5° (Epoch: 31 July)

Passes to include: visible only visible/night all

~~updated~~ Click on the date to get a star chart and other pass details.

Date	Brightness [Mag]	Start			Highest point			End			Pass type
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.	
11 Aug	3.5	00:48:59	10°	WNW	00:52:58	52°	SW	00:55:40	19°	SSE	Visible
11 Aug	5.1	02:28:08	10°	W	02:30:28	15°	WSW	02:31:10	14°	SW	Visible
11 Aug	3.6	23:03:15	10°	WNW	23:07:20	70°	NNE	23:11:24	10°	ESE	Visible
12 Aug	3.7	00:41:37	10°	WNW	00:45:32	47°	SW	00:48:00	20°	SSE	Visible
12 Aug	5.3	02:21:02	10°	W	02:22:57	13°	WSW	02:23:30	13°	SW	Visible
12 Aug	3.5	22:55:52	10°	WNW	22:59:58	74°	NNE	23:04:02	10°	ESE	Visible
13 Aug	3.9	00:34:15	10°	WNW	00:38:06	42°	SW	00:40:24	21°	SSE	Visible
13 Aug	5.5	02:14:08	10°	W	02:15:26	11°	WSW	02:15:53	11°	WSW	Visible
13 Aug	3.4	22:48:29	10°	WNW	22:52:35	79°	NNE	22:56:40	10°	ESE	Visible
14 Aug	4.1	00:26:53	10°	WNW	00:30:39	37°	SW	00:32:50	21°	S	Visible
14 Aug	3.4	22:41:05	10°	WNW	22:45:12	85°	NNE	22:49:17	10°	ESE	Visible
15 Aug	4.3	00:19:31	10°	WNW	00:23:12	33°	SW	00:25:19	20°	S	Visible
15 Aug	3.3	22:33:42	10°	WNW	22:37:48	89°	SSW	22:41:53	10°	ESE	Visible
16 Aug	4.5	00:12:10	10°	WNW	00:15:44	30°	SW	00:17:50	19°	S	Visible
16 Aug	3.3	22:26:18	10°	WNW	22:30:23	83°	SSW	22:34:28	10°	ESE	Visible
17 Aug	4.7	00:04:49	10°	WNW	00:08:15	26°	SW	00:10:24	17°	S	Visible
17 Aug	4.9	23:57:30	10°	WNW	00:00:46	24°	SW	00:03:00	15°	S	Visible
18 Aug	5.1	23:50:11	10°	WNW	23:53:16	21°	SW	23:55:37	13°	SSW	Visible
19 Aug	5.3	23:42:55	10°	WNW	23:45:45	18°	WSW	23:48:17	11°	SSW	Visible
20 Aug	5.5	23:35:40	10°	W	23:38:14	16°	WSW	23:40:46	10°	SSW	Visible

Часть 6. Космический корабль GENESIS II

Date	Brightness [Mag]	Start			Highest point			End			Pass type
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.	
11 Aug	5.1	00:37:17	10°	WNW	00:41:29	57°	N	00:45:37	10°	E	Visible
11 Aug	4.3	02:15:47	10°	WNW	02:20:02	85°	SSW	02:24:12	10°	ESE	Visible
11 Aug	5.3	03:54:21	10°	WNW	03:57:57	28°	SW	04:01:30	10°	S	Visible
11 Aug	4.9	22:51:36	10°	W	22:55:50	65°	NNW	23:00:02	10°	ENE	Visible
12 Aug	5.1	00:30:20	10°	WNW	00:34:32	58°	N	00:38:41	10°	E	Visible
12 Aug	4.3	02:08:49	10°	WNW	02:13:03	79°	SSW	02:17:12	10°	SE	Visible
12 Aug	5.4	03:47:26	10°	WNW	03:50:53	25°	SW	03:54:16	10°	S	Visible
12 Aug	5.0	22:44:39	10°	W	22:48:53	62°	NNW	22:53:04	10°	ENE	Visible
13 Aug	5.0	00:23:23	10°	WNW	00:27:35	60°	N	00:31:44	10°	E	Visible
13 Aug	4.3	02:01:50	10°	WNW	02:06:03	72°	SSW	02:10:10	10°	SE	Visible
13 Aug	5.6	03:40:33	10°	WNW	03:43:48	22°	SW	03:46:29	13°	S	Visible
13 Aug	5.1	22:37:42	10°	W	22:41:55	60°	N	22:46:06	10°	ENE	Visible
14 Aug	4.9	00:16:25	10°	WNW	00:20:38	62°	NNE	00:24:47	10°	E	Visible
14 Aug	4.3	01:54:51	10°	WNW	01:59:03	65°	SW	02:02:49	12°	SE	Visible
14 Aug	5.8	03:33:42	10°	WNW	03:36:43	20°	WSW	03:38:17	16°	SSW	Visible
14 Aug	5.1	22:30:46	10°	W	22:34:58	58°	N	22:39:08	10°	ENE	Visible
15 Aug	4.8	00:09:27	10°	WNW	00:13:40	64°	NNE	00:17:49	10°	E	Visible
15 Aug	4.4	01:47:53	10°	WNW	01:52:02	58°	SW	01:54:57	18°	SE	Visible
15 Aug	5.9	03:26:52	10°	W	03:29:36	17°	WSW	03:30:26	16°	SW	Visible
16 Aug	4.7	00:02:28	10°	WNW	00:06:42	68°	NNE	00:10:52	10°	E	Visible
16 Aug	4.5	01:40:54	10°	WNW	01:45:00	52°	SW	01:47:18	23°	SSE	Visible
16 Aug	6.1	03:20:06	10°	W	03:22:29	15°	WSW	03:22:48	15°	SW	Visible
16 Aug	4.6	23:55:30	10°	WNW	23:59:44	72°	NNE	00:03:54	10°	ESE	Visible
17 Aug	4.7	01:33:55	10°	WNW	01:37:58	46°	SW	01:39:47	27°	SSE	Visible
17 Aug	6.3	03:13:26	10°	W	03:15:18	13°	WSW	03:15:18	13°	WSW	Visible
17 Aug	4.5	23:48:31	10°	WNW	23:52:45	76°	NNE	23:56:53	10°	ESE	Visible
18 Aug	4.9	01:26:57	10°	WNW	01:30:55	41°	SW	01:32:23	30°	S	Visible
18 Aug	6.5	03:06:58	10°	W	03:07:54	11°	WSW	03:07:54	11°	WSW	Visible
18 Aug	4.4	23:41:31	10°	WNW	23:45:46	81°	NNE	23:49:33	12°	ESE	Visible
19 Aug	5.0	01:19:59	10°	WNW	01:23:51	37°	SW	01:25:04	30°	S	Visible
19 Aug	4.4	23:34:31	10°	WNW	23:38:46	87°	NNE	23:42:17	14°	ESE	Visible
20 Aug	5.2	01:13:01	10°	WNW	01:16:47	33°	SW	01:17:48	28°	SSW	Visible
20 Aug	4.3	23:27:32	10°	WNW	23:31:46	87°	SSW	23:35:04	16°	ESE	Visible

Часть 7. Все остальные спутники ярче 3m

(данные до полуночи и после полуночи разделены на две таблицы)

Daily predictions for brighter satellites

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
ALOS	2.7	22:43:07	10°	S	22:47:47	65°	WSW	22:52:30	10°	NNW
SL-16 R/B	2.4	22:51:42	10°	NW	22:57:24	72°	NE	23:03:04	10°	SE
YAOGAN 6	2.7	23:34:35	13°	SSE	23:37:55	82°	ENE	23:41:41	10°	NNW
Cosmos 2333 Rocket	2.4	23:36:57	10°	NW	23:42:34	67°	SW	23:47:35	13°	SSE
Cosmos 2237 Rocket	2.8	23:40:17	10°	NW	23:45:41	49°	WSW	23:50:41	12°	S
ISS	-1.4	23:42:51	10°	SW	23:44:55	15°	S	23:45:46	14°	S
Terra	2.6	23:44:51	10°	S	23:49:28	49°	W	23:54:06	10°	NNW
CZ-4B R/B	2.7	23:44:52	10°	S	23:48:48	47°	W	23:52:49	10°	NNW
Cosmos 1743	2.8	23:46:48	10°	S	23:50:45	71°	ESE	23:54:42	10°	NNE
H-2A R/B	2.1	23:49:04	13°	SSE	23:53:45	83°	WSW	23:58:49	10°	NNW

Daily predictions for brighter satellites

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 2227 Rocket	2.9	23:59:51	13°	S	00:04:17	34°	ESE	00:09:20	10°	NE
Tubsat N rocket	2.8	00:08:13	10°	NNW	00:10:56	71°	ENE	00:12:31	22°	SSE
Lacrosse 4	3.0	00:11:19	10°	W	00:15:59	46°	NNW	00:20:39	10°	NE
Cosmos 1151	2.8	00:39:21	13°	SSW	00:42:04	56°	WNW	00:45:16	10°	N
Coronas F rocket	2.4	00:59:21	24°	SSE	01:00:55	42°	E	01:04:03	10°	NNE
Cosmos 1707	2.9	01:04:18	10°	NNW	01:08:17	67°	W	01:10:46	22°	S
Cosmos 2227 Rocket	2.3	01:42:20	10°	SW	01:48:01	78°	NW	01:53:42	10°	NE
Cosmos 1953	2.3	01:58:38	22°	SSW	02:01:13	86°	WNW	02:05:21	10°	NNE
Cosmos 2297 Rocket	2.2	02:07:41	13°	SW	02:12:52	89°	NW	02:18:35	10°	NE
Helios 1B rocket	3.0	02:14:43	12°	SE	02:18:36	61°	ENE	02:22:50	10°	NNW
USA 161	2.4	02:38:33	13°	SE	02:41:05	51°	ENE	02:44:04	10°	N
Cosmos 1674	2.8	02:47:23	10°	NNW	02:51:27	87°	ENE	02:54:49	15°	SSE
Cosmos 1340	2.8	02:50:49	20°	SSW	02:53:30	87°	ESE	02:57:30	10°	NNE
Cosmos 2292 Rocket	2.6	03:02:02	22°	S	03:03:50	80°	ESE	03:06:53	10°	NNE
Lacrosse 4	2.4	03:34:22	10°	NW	03:39:11	61°	NNE	03:43:57	10°	ESE
Cosmos 2082 Rocket	2.4	03:51:04	10°	NW	03:56:44	78°	NE	04:02:22	10°	SE
TITAN 4B R/B	2.6	03:56:47	12°	SSW	04:00:10	31°	SSE	04:04:13	10°	E
Cosmos 2263 Rocket	2.5	04:12:44	10°	SSW	04:18:15	64°	ESE	04:23:49	10°	NE
Cosmos 1271 Rocket	2.9	04:20:27	10°	NNW	04:24:31	65°	WSW	04:28:36	10°	S
Okean O Rocket	2.9	04:33:36	10°	NNE	04:37:53	41°	E	04:42:07	10°	SSE
Cosmos 1222 Rocket	2.6	04:35:51	10°	SSW	04:39:07	56°	WNW	04:42:27	10°	NNE
ERS-2	2.5	04:36:22	10°	SSE	04:40:17	79°	ENE	04:44:14	10°	NNW

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
SL-16 R/B	2.4	22:37:48	10°	NW	22:43:30	71°	NE	22:49:10	10°	SE
Terra	1.9	22:49:36	10°	SSE	22:54:21	75°	ENE	22:59:08	10°	NNW
ISS	-1.4	22:54:22	10°	SW	22:56:31	16°	S	22:58:40	10°	SE
Lacrosse 4	2.3	23:06:01	10°	WSW	23:10:49	65°	NNW	23:15:38	10°	NE
H-2A R/B	2.4	23:11:24	10°	SSE	23:14:50	87°	ENE	23:18:19	10°	NNW
IGS 1A	1.8	23:13:56	11°	SSE	23:17:08	80°	ENE	23:20:28	10°	NNW
Cosmos 1441	2.9	23:17:06	10°	NNW	23:20:26	77°	WSW	23:23:37	11°	S
YAOGAN 6	2.9	23:18:24	12°	SSE	23:21:50	61°	ENE	23:25:33	10°	NNW
H-2A R/B	2.2	23:18:36	11°	SE	23:23:33	67°	ENE	23:28:33	10°	NNW
Cosmos 2333 Rocket	2.4	23:24:41	10°	NW	23:30:18	67°	SW	23:35:27	12°	SSE
Cosmos 2237 Rocket	2.8	23:25:36	10°	NW	23:31:02	50°	WSW	23:36:17	11°	SSE
CZ-4B R/B	2.2	23:27:34	10°	S	23:31:36	65°	WSW	23:35:44	10°	NNW
Cosmos 1689 Rocket	2.6	23:33:00	12°	S	23:36:08	75°	WSW	23:39:38	10°	NNW
Cosmos 2219 Rocket	2.9	23:38:51	10°	NW	23:44:14	45°	WSW	23:49:18	11°	S
Cosmos 1743	2.8	23:40:13	10°	S	23:44:10	73°	E	23:48:08	10°	NNE
Cosmos 2227 Rocket	2.9	23:44:48	11°	S	23:49:33	33°	ESE	23:54:34	10°	NE
Cosmos 1151	2.4	23:51:54	15°	S	23:54:23	57°	E	23:57:34	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
ISS	-0.8	00:31:22	10°	SW	00:31:36	10°	SW	00:31:36	10°	SW
Cosmos 2221	2.6	01:03:34	21°	S	01:06:24	71°	E	01:10:47	10°	NNE
Cosmos 2227 Rocket	2.3	01:27:35	10°	SW	01:33:15	80°	NW	01:38:57	10°	NE
Coronas F rocket	2.4	01:51:10	21°	SW	01:53:06	49°	WNW	01:56:19	10°	N
Cosmos 2297 Rocket	2.2	01:52:43	13°	SW	01:57:54	89°	SE	02:03:37	10°	NE
Cosmos 1953	2.4	01:59:38	22°	SSW	02:02:13	74°	WNW	02:06:21	10°	NNE
SL-8 R/B	3.0	02:12:37	10°	NNE	02:15:57	69°	WNW	02:17:48	24°	SSW
Helios 1B rocket	2.7	02:27:21	14°	SSE	02:30:59	75°	ENE	02:35:16	10°	NNW
Cosmos 1674	2.8	02:39:28	10°	NNW	02:43:33	87°	ENE	02:46:40	17°	SSE
Cosmos 1340	2.7	02:42:12	22°	SSW	02:44:43	87°	ESE	02:48:42	10°	NNE
SL-8 R/B	2.8	02:42:03	10°	NNE	02:45:13	73°	WNW	02:47:00	24°	SSW
USA 161	1.6	03:16:56	18°	S	03:19:01	64°	WSW	03:22:04	10°	NNW
Cosmos 2082 Rocket	2.4	03:36:42	10°	NW	03:42:21	77°	NE	03:48:00	10°	SE
Cosmos 1222 Rocket	2.5	03:55:45	12°	S	03:58:45	73°	ESE	04:02:07	10°	NNE
Cosmos 2263 Rocket	2.5	03:56:29	11°	SSW	04:01:42	61°	ESE	04:07:15	10°	NE
TITAN 4B R/B	2.3	03:58:55	13°	SW	04:02:27	36°	SSE	04:06:40	10°	E
Lacrosse 4	1.8	04:10:22	10°	NW	04:15:14	86°	SW	04:20:03	10°	SE
Cosmos 1271 Rocket	2.9	04:13:49	10°	NNW	04:17:53	63°	WSW	04:21:58	10°	S
ERS-2	2.7	04:31:01	10°	SSE	04:34:55	71°	ENE	04:38:52	10°	NNW

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
H-2A R/B	3.0	22:41:34	10°	SE	22:44:52	46°	ENE	22:48:13	10°	N
Meteor 1-30 Rocket	2.9	22:46:32	10°	NNE	22:50:01	84°	ESE	22:53:28	10°	SSW
H-2A R/B	2.6	22:48:36	10°	SE	22:53:27	45°	ENE	22:58:14	10°	NNW
Cosmos 1242	2.9	23:02:37	10°	NNW	23:05:48	61°	ENE	23:08:44	11°	SSE
Cosmos 1689 Rocket	2.6	23:07:36	11°	SSE	23:10:54	65°	ENE	23:14:23	10°	NNW
CZ-4B R/B	1.9	23:10:21	10°	SSE	23:14:27	87°	WSW	23:18:36	10°	NNW
Cosmos 2237 Rocket	2.8	23:10:55	10°	NW	23:16:22	52°	WSW	23:21:47	10°	SSE
Cosmos 2333 Rocket	2.4	23:12:24	10°	NW	23:18:02	67°	SW	23:23:22	11°	SSE
Cosmos 2219 Rocket	2.9	23:22:39	10°	NW	23:28:04	47°	WSW	23:33:26	10°	S
Cosmos 2227 Rocket	3.0	23:29:52	10°	S	23:34:49	32°	ESE	23:39:47	10°	NE
Terra	2.3	23:32:30	10°	S	23:37:12	59°	WSW	23:41:56	10°	NNW
Cosmos 1743	2.7	23:33:38	10°	S	23:37:36	75°	ESE	23:41:33	10°	NNE
ISS	-1.2	23:42:20	10°	SW	23:43:55	13°	SSW	23:44:34	12°	S
Lacrosse 4	3.0	23:42:21	10°	W	23:47:01	46°	NNW	23:51:42	10°	NE
Tubsat N rocket	3.0	23:43:11	10°	NNW	23:45:53	62°	ENE	23:47:37	19°	SE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 1242 Rocket	2.8	00:19:12	11°	SSW	00:22:44	69°	WNW	00:26:23	10°	NNE
H-2A R/B	2.7	00:28:50	15°	S	00:32:59	48°	W	00:37:51	10°	NNW
Coronas F rocket	1.7	01:09:43	28°	S	01:11:19	78°	ESE	01:14:37	10°	NNE
Cosmos 2227 Rocket	2.3	01:12:49	10°	SW	01:18:29	82°	NW	01:24:11	10°	NE
Cosmos 2221	2.6	01:19:03	20°	SSW	01:22:02	80°	WNW	01:26:28	10°	NNE
Cosmos 2297 Rocket	2.2	01:37:42	12°	SW	01:42:57	87°	SE	01:48:40	10°	NE
Cosmos 1953	2.6	02:00:37	21°	SSW	02:03:14	64°	WNW	02:07:20	10°	N
Cosmos 1674	2.8	02:31:34	10°	NNW	02:35:38	87°	ENE	02:38:31	19°	SSE
Cosmos 1340	2.7	02:33:33	23°	SSW	02:35:56	86°	ESE	02:39:55	10°	NNE
Helios 1B rocket	2.5	02:39:58	16°	SSE	02:43:22	90°	WSW	02:47:41	10°	NNW
Lacrosse 4	2.4	03:05:25	10°	NW	03:10:14	61°	NNE	03:15:00	10°	ESE
Cosmos 2082 Rocket	2.4	03:22:20	10°	NW	03:27:59	75°	NE	03:33:38	10°	SE
Cosmos 2263 Rocket	2.5	03:40:21	14°	SSW	03:45:09	58°	ESE	03:50:40	10°	NE
USA 161	2.9	03:55:17	15°	SW	03:57:06	26°	W	03:59:45	10°	NW
TITAN 4B R/B	2.1	04:01:01	12°	SW	04:04:46	40°	SSE	04:09:06	10°	E
Cosmos 1271 Rocket	3.0	04:07:11	10°	NNW	04:11:15	61°	WSW	04:15:19	10°	S
ERS-2	2.9	04:25:40	10°	SSE	04:29:33	64°	ENE	04:33:28	10°	NNW
Cosmos 1833 Rocket	2.7	04:27:00	10°	NW	04:32:42	88°	SW	04:38:22	10°	SE
Cosmos 1220	2.8	04:43:26	10°	SSW	04:46:20	28°	SE	04:49:16	10°	ENE
Lacrosse 4	2.0	04:46:23	10°	NW	04:51:03	49°	SW	04:55:40	10°	SSE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Lacrosse 4	2.3	22:37:04	10°	WSW	22:41:52	65°	NNW	22:46:41	10°	NE
Terra	2.0	22:37:28	10°	SE	22:42:09	63°	ENE	22:46:53	10°	NNW
CZ-4B R/B	2.0	22:53:14	10°	SSE	22:57:19	70°	ENE	23:01:26	10°	NNW
ISS	-1.2	22:53:36	10°	SW	22:55:30	14°	SSW	22:57:25	10°	SSE
Cosmos 2237 Rocket	2.7	22:56:14	10°	NW	23:01:42	53°	WSW	23:07:09	10°	SSE
Cosmos 2333 Rocket	2.4	23:00:08	10°	NW	23:05:45	67°	SW	23:11:18	10°	SSE
Cosmos 2219 Rocket	2.9	23:06:26	10°	NW	23:11:54	49°	WSW	23:17:19	10°	S
Cosmos 2227 Rocket	3.0	23:15:11	10°	S	23:20:05	32°	ESE	23:25:00	10°	NE
IGS 1A	1.9	23:27:24	13°	SSE	23:30:18	77°	WSW	23:33:39	10°	NNW
Cosmos 1743	2.7	23:27:04	10°	S	23:31:01	76°	ESE	23:34:58	10°	NNE
Cosmos 1151	2.1	23:49:42	13°	S	23:52:30	80°	ESE	23:55:44	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 1242 Rocket	2.6	00:01:28	10°	SSW	00:05:04	83°	WNW	00:08:44	10°	NNE
Coronas F rocket	2.6	00:28:15	24°	SE	00:29:40	36°	E	00:32:43	10°	NNE
Cosmos 2227 Rocket	2.3	00:58:03	10°	SW	01:03:43	84°	NW	01:09:25	10°	NE
Cosmos 2297 Rocket	2.2	01:22:36	12°	SW	01:28:00	85°	SE	01:33:42	10°	NE
Cosmos 2058	3.0	01:23:56	10°	NNW	01:28:15	80°	WSW	01:30:43	25°	S
Cosmos 1315	2.9	01:47:30	10°	NNW	01:51:03	77°	WSW	01:52:43	29°	S
Cosmos 1953	2.9	02:01:36	20°	SW	02:04:15	55°	WNW	02:08:19	10°	N
Cosmos 1340	2.7	02:24:54	25°	SSW	02:27:09	86°	ESE	02:31:08	10°	NNE
Cosmos 1674	2.8	02:23:38	10°	NNW	02:27:43	87°	ENE	02:30:24	21°	SSE
TITAN 4B R/B	2.7	02:26:58	21°	SSE	02:28:04	23°	SE	02:31:38	10°	E
SL-8 R/B	2.7	02:31:49	10°	NNE	02:35:00	87°	ESE	02:36:31	29°	SSW
Cosmos 1733 Rocket	3.0	02:32:33	10°	NNW	02:36:56	87°	WSW	02:40:00	19°	SSE
Cosmos 2292 Rocket	2.7	02:35:30	29°	S	02:36:50	68°	E	02:40:01	10°	NNE
Cosmos 1470	2.9	02:41:17	23°	S	02:43:42	70°	E	02:47:42	10°	NNE
Helios 1B rocket	2.5	02:52:35	18°	S	02:55:47	74°	WSW	03:00:05	10°	NNW
USA 161	1.6	03:01:13	19°	SSE	03:03:16	87°	ENE	03:06:20	10°	NNW
Cosmos 2082 Rocket	2.4	03:07:58	10°	NW	03:13:37	74°	NE	03:19:16	10°	SE
Cosmos 2263 Rocket	2.6	03:24:12	16°	SSW	03:28:36	55°	ESE	03:34:06	10°	NE
Lacrosse 4	1.7	03:41:25	10°	NW	03:46:17	86°	SW	03:51:06	10°	SE
Cosmos 1271 Rocket	3.0	04:00:33	10°	NNW	04:04:37	59°	WSW	04:08:40	10°	S
TITAN 4B R/B	2.0	04:03:06	11°	WSW	04:07:05	44°	SSE	04:11:30	10°	E
Cosmos 1222 Rocket	2.6	04:09:26	13°	SSW	04:12:15	57°	WNW	04:15:35	10°	NNE
Cosmos 1833 Rocket	2.8	04:10:27	10°	NW	04:16:09	89°	NE	04:21:50	10°	SE
Cosmos 1626	2.2	04:48:39	10°	NNW	04:52:36	75°	WSW	04:56:30	10°	S
Cosmos 2082 Rocket	2.7	04:52:20	10°	NW	04:57:27	37°	WSW	05:02:34	10°	S

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Warning! You have selected a time quite far from the present. Please be aware that prediction accuracy deteriorates as you go further into the future or past.

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
CZ-4B R/B	2.3	22:36:13	10°	SE	22:40:13	52°	ENE	22:44:14	10°	N
Cosmos 2237 Rocket	2.7	22:41:33	10°	NW	22:47:02	55°	WSW	22:52:30	10°	SSE
Cosmos 1441	2.8	22:41:35	10°	NNW	22:44:56	87°	ENE	22:48:15	10°	SSE
IGS 1A	2.4	22:47:29	10°	SE	22:50:39	44°	ENE	22:53:51	10°	N
Cosmos 2333 Rocket	2.4	22:47:52	10°	NW	22:53:29	67°	SW	22:59:04	10°	SSE
Cosmos 2219 Rocket	2.8	22:50:14	10°	NW	22:55:44	51°	WSW	23:01:10	10°	SSE
Cosmos 1242	2.7	22:53:52	10°	NNW	22:57:04	76°	ENE	23:00:09	11°	SSE
Lacrosse 4	3.0	23:13:24	10°	W	23:18:04	46°	NNW	23:22:45	10°	NE
H-2A R/B	2.4	23:14:42	12°	SSE	23:17:52	88°	WSW	23:21:21	10°	NNW
Terra	2.0	23:20:12	10°	S	23:24:57	71°	WSW	23:29:44	10°	NNW
Cosmos 1743	2.7	23:20:29	10°	S	23:24:26	78°	ESE	23:28:24	10°	NNE
H-2A R/B	2.1	23:27:54	13°	SSE	23:32:25	75°	ENE	23:37:25	10°	NNW
Cosmos 1242 Rocket	2.5	23:43:46	10°	SSW	23:47:24	83°	ESE	23:51:04	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Warning! You have selected a time quite far from the present. Please be aware that prediction accuracy deteriorates as you go further into the future or past.

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 2227 Rocket	2.2	00:43:17	10°	SW	00:48:57	86°	NW	00:54:39	10°	NE
Cosmos 2297 Rocket	2.2	01:07:25	10°	SW	01:13:02	83°	SE	01:18:45	10°	NE
Coronas F rocket	2.2	01:20:00	24°	SW	01:21:46	57°	WNW	01:25:02	10°	N
SL-8 R/B	2.8	01:51:23	10°	NNE	01:54:43	72°	ESE	01:56:05	32°	S
Cosmos 1340	2.7	02:16:14	27°	SSW	02:18:21	85°	ESE	02:22:20	10°	NNE
Cosmos 1674	2.8	02:15:43	10°	NNW	02:19:47	87°	ENE	02:22:17	23°	SSE
TITAN 4B R/B	2.5	02:29:01	24°	S	02:30:17	28°	SSE	02:34:09	10°	E
Cosmos 1470	2.8	02:37:49	24°	S	02:40:06	76°	ESE	02:44:07	10°	NNE
Lacrosse 4	2.3	02:36:28	10°	NW	02:41:17	61°	NNE	02:46:03	10°	ESE
Cosmos 2082 Rocket	2.5	02:53:36	10°	NW	02:59:15	73°	NE	03:04:53	10°	SE
Helios 1B rocket	2.6	03:05:13	19°	S	03:08:12	60°	WSW	03:12:28	10°	NNW
Cosmos 2263 Rocket	2.6	03:08:01	18°	S	03:12:03	53°	ESE	03:17:31	10°	NE
Cosmos 1222 Rocket	2.4	03:29:34	19°	S	03:31:51	72°	ESE	03:35:13	10°	NNE
USA 161	2.3	03:39:32	20°	SSW	03:41:14	37°	W	03:44:07	10°	NNW
Cosmos 1833 Rocket	2.8	03:53:54	10°	NW	03:59:37	85°	NE	04:05:17	10°	SE
TITAN 4B R/B	1.9	04:05:13	10°	WSW	04:09:26	47°	S	04:13:53	10°	E
Lacrosse 4	2.0	04:17:26	10°	NW	04:22:06	49°	SW	04:26:43	10°	SSE
Cosmos 1220	2.2	04:29:26	10°	SSW	04:32:32	38°	SE	04:35:41	10°	ENE
Cosmos 2082 Rocket	2.7	04:37:57	10°	NW	04:43:07	38°	WSW	04:48:15	10°	S
Cosmos 1626	2.2	04:38:05	10°	NNW	04:42:02	79°	WSW	04:45:57	10°	S
Cosmos 2263 Rocket	2.6	04:50:33	10°	WSW	04:56:05	57°	NW	05:01:40	10°	NE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Terra	2.2	22:25:22	10°	SE	22:29:59	53°	ENE	22:34:38	10°	NNW
Cosmos 2237 Rocket	2.7	22:26:52	10°	NW	22:32:23	56°	WSW	22:37:51	10°	SSE
CZ-4C R/B	3.0	22:33:05	10°	SSE	22:36:27	73°	ENE	22:39:57	10°	NNW
Cosmos 2219 Rocket	2.8	22:34:01	10°	NW	22:39:33	53°	WSW	22:45:02	10°	SSE
Cosmos 2333 Rocket	2.5	22:35:35	10°	NW	22:41:13	67°	SW	22:46:48	10°	SSE
Meteor 1-30 Rocket	2.9	22:38:24	10°	NNE	22:41:52	69°	ESE	22:45:18	10°	S
H-2A R/B	2.9	22:44:31	10°	SE	22:47:51	49°	ENE	22:51:14	10°	N
ALOS	2.7	22:44:56	10°	S	22:49:36	63°	WSW	22:54:17	10°	NNW
ISS	-0.9	22:53:20	10°	SW	22:54:25	11°	SSW	22:55:29	10°	S
H-2A R/B	2.5	22:57:27	10°	SE	23:02:17	50°	ENE	23:07:06	10°	NNW
Cosmos 1743	2.7	23:13:54	10°	S	23:17:51	80°	ESE	23:21:48	10°	NNE
Cosmos 1689 Rocket	2.5	23:25:41	15°	SSE	23:28:33	87°	WSW	23:32:05	10°	NNW
Cosmos 1242 Rocket	2.5	23:26:08	10°	S	23:29:45	69°	ESE	23:33:24	10°	NNE
IGS 1A	2.3	23:40:45	15°	S	23:43:23	57°	WSW	23:46:40	10°	NNW
Cosmos 1151	2.4	23:47:19	10°	SSW	23:50:31	74°	WNW	23:53:46	10°	NNE
YAOGAN 6	2.7	23:48:33	17°	S	23:51:20	77°	WSW	23:55:07	10°	NNW

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Warning! You have selected a time quite far from the present. Please be aware that prediction accuracy deteriorates as you go further into the future or past.

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Terra	3.0	00:03:33	10°	SSW	00:07:57	37°	W	00:12:24	10°	NNW
Cosmos 2221	2.6	00:28:24	21°	S	00:31:14	66°	E	00:35:37	10°	NNE
Cosmos 2227 Rocket	2.2	00:28:31	10°	SW	00:34:11	88°	NW	00:39:53	10°	NE
Coronas F rocket	1.8	00:38:29	29°	S	00:40:00	66°	E	00:43:15	10°	NNE
H-2A R/B	2.8	00:38:07	16°	SSW	00:41:55	42°	W	00:46:40	10°	NNW
Cosmos 2297 Rocket	2.2	00:52:25	10°	SW	00:58:05	81°	SE	01:03:47	10°	NE
Lacrosse 4	3.0	01:31:27	10°	NW	01:36:06	44°	NNE	01:40:43	10°	E
Cosmos 1340	2.7	02:07:33	28°	SSW	02:09:33	85°	ESE	02:13:32	10°	NNE
Cosmos 1674	2.8	02:07:47	10°	NNW	02:11:52	87°	ENE	02:14:11	25°	SSE
SL-8 R/B	2.8	02:21:25	10°	NNE	02:24:35	66°	ESE	02:25:50	33°	S
TITAN 4B R/B	2.3	02:31:02	25°	SSW	02:32:33	33°	SSE	02:36:36	10°	E
Cosmos 1470	2.8	02:34:20	26°	S	02:36:30	82°	ESE	02:40:31	10°	NNE
Cosmos 2082 Rocket	2.5	02:39:14	10°	NW	02:44:53	71°	NE	02:50:31	10°	SE
USA 161	2.1	02:45:26	19°	SE	02:47:27	59°	ENE	02:50:29	10°	N
Cosmos 2263 Rocket	2.6	02:51:49	20°	S	02:55:31	50°	ESE	03:00:57	10°	NE
Lacrosse 4	1.7	03:12:28	10°	NW	03:17:20	87°	SW	03:22:09	10°	SE
Helios 1B rocket	2.9	03:17:50	19°	S	03:20:39	49°	W	03:24:49	10°	NNW
Cosmos 1833 Rocket	2.8	03:37:22	10°	NW	03:43:04	82°	NE	03:48:44	10°	SE
ATLAS 3B R/B	3.0	03:38:46	10°	WNW	03:46:38	71°	SW	03:54:15	10°	SE
TITAN 4B R/B	1.8	04:07:32	10°	WSW	04:11:46	49°	S	04:16:16	10°	ESE
Cosmos 2082 Rocket	2.7	04:23:35	10°	NW	04:28:46	39°	WSW	04:33:56	10°	S
Cosmos 1626	2.2	04:27:31	10°	NNW	04:31:28	83°	WSW	04:35:24	10°	S
Cosmos 2263 Rocket	2.6	04:33:57	10°	WSW	04:39:29	59°	NW	04:45:05	10°	NE
Okean O Rocket	2.4	04:50:46	10°	NNE	04:55:12	54°	ESE	04:59:36	10°	S
Lacrosse 4	2.7	04:53:40	10°	WNW	04:57:39	26°	WSW	05:01:38	10°	S

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

Warning! You have selected a time quite far from the present. Please be aware that prediction accuracy deteriorates as you go further into the future or past.

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 2219 Rocket	2.8	22:17:49	10°	NW	22:23:23	56°	WSW	22:28:53	10°	SSE
Cosmos 2333 Rocket	2.5	22:23:19	10°	NW	22:28:56	67°	SW	22:34:32	10°	SSE
H-2A R/B	3.0	22:27:42	10°	ESE	22:32:15	35°	NE	22:36:45	10°	N
Lacrosse 4	3.0	22:44:27	10°	W	22:49:07	47°	NNW	22:53:48	10°	NE
Cosmos 1242	2.7	22:44:57	10°	NNW	22:48:09	88°	WSW	22:51:20	10°	SSE
Cosmos 1151	2.7	22:59:43	10°	S	23:02:47	43°	E	23:05:53	10°	NNE
Cosmos 1689 Rocket	2.8	23:00:16	12°	SE	23:03:19	55°	ENE	23:06:46	10°	N
IGS 1A	2.1	23:00:43	13°	SSE	23:03:37	59°	ENE	23:06:54	10°	N
Cosmos 1743	2.7	23:07:18	10°	S	23:11:15	81°	ESE	23:15:13	10°	NNE
Terra	1.9	23:08:00	10°	SSE	23:12:43	84°	WSW	23:17:31	10°	NNW
Cosmos 1242 Rocket	2.7	23:08:32	10°	S	23:12:06	57°	ESE	23:15:42	10°	NNE
YAOGAN 6	2.7	23:32:20	17°	SSE	23:35:12	79°	ENE	23:38:58	10°	NNW
CZ-4B R/B	2.4	23:36:09	12°	S	23:39:49	56°	WSW	23:43:54	10°	NNW

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 1666	3.0	00:05:27	20°	S	00:08:05	58°	E	00:12:04	10°	NNE
H-2A R/B	2.2	00:07:40	17°	S	00:11:33	65°	WSW	00:16:31	10°	NNW
Cosmos 2227 Rocket	2.2	00:13:45	10°	SW	00:19:26	89°	NW	00:25:07	10°	NE
Cosmos 1953	3.0	00:28:24	24°	SSE	00:30:27	43°	E	00:34:22	10°	NNE
Cosmos 2297 Rocket	2.1	00:37:28	10°	SSW	00:43:08	79°	SE	00:48:50	10°	NE
Cosmos 2221	2.6	00:43:51	20°	SSW	00:46:51	85°	WNW	00:51:18	10°	NNE
Cosmos 1340	2.7	01:58:51	30°	SSW	02:00:45	84°	ESE	02:04:44	10°	NNE
Cosmos 1674	2.8	01:59:51	10°	NNW	02:03:56	86°	ENE	02:06:05	27°	SSE
Cosmos 2292 Rocket	3.0	02:08:44	35°	SSE	02:09:46	59°	E	02:13:07	10°	NNE
Lacrosse 4	2.3	02:07:31	10°	NW	02:12:20	61°	NNE	02:17:06	10°	ESE
SL-8 R/B	2.8	02:07:59	10°	NNE	02:11:19	81°	WNW	02:12:39	33°	SSW
Cosmos 2082 Rocket	2.5	02:24:52	10°	NW	02:30:31	70°	NE	02:36:09	10°	SE
Cosmos 1470	2.7	02:30:50	28°	SSW	02:32:54	88°	ESE	02:36:55	10°	NNE
TITAN 4B R/B	2.1	02:33:01	25°	SSW	02:34:50	37°	SSE	02:39:02	10°	E
Cosmos 2263 Rocket	2.7	02:35:35	22°	S	02:38:59	48°	ESE	02:44:22	10°	NE
ATLAS 3B R/B	3.0	02:51:34	10°	WNW	02:59:31	83°	SSW	03:07:14	10°	ESE
Cosmos 1833 Rocket	2.9	03:20:49	10°	NW	03:26:31	79°	NE	03:32:11	10°	SE
USA 161	1.8	03:23:43	24°	S	03:25:18	54°	WSW	03:28:19	10°	NNW
Cosmos 1222 Rocket	2.6	03:43:06	20°	SW	03:45:15	58°	WNW	03:48:36	10°	NNE
Lacrosse 4	1.9	03:48:29	10°	NW	03:53:09	49°	SW	03:57:46	10°	SSE
Cosmos 2082 Rocket	2.7	04:09:13	10°	NW	04:14:25	40°	WSW	04:19:38	10°	S
TITAN 4B R/B	1.8	04:09:52	10°	WSW	04:14:07	49°	S	04:18:37	10°	ESE
Cosmos 1220	1.7	04:15:58	14°	SW	04:18:38	51°	SE	04:21:56	10°	ENE
Cosmos 1626	2.2	04:16:57	10°	NNW	04:20:54	87°	WSW	04:24:50	10°	SSE
Cosmos 2263 Rocket	2.6	04:17:21	10°	WSW	04:22:54	61°	NW	04:28:31	10°	NE
CENTAUR R/B	2.9	04:19:27	11°	SW	04:25:49	70°	SE	04:33:02	10°	ENE
Lacrosse 5	2.8	04:29:19	11°	SW	04:33:42	34°	SSE	04:38:14	10°	E
Cosmos 2278 Rocket	2.3	04:49:16	10°	SW	04:54:57	85°	SE	05:00:39	10°	NE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
ALOS	2.4	22:26:02	10°	SSE	22:30:45	83°	WSW	22:35:30	10°	NNW
Cosmos 1242 Rocket	2.9	22:50:58	10°	S	22:54:27	47°	E	22:57:59	10°	NNE
Cosmos 1743	2.7	23:00:43	10°	S	23:04:40	83°	ESE	23:08:38	10°	NNE
YAOGAN 6	2.9	23:16:08	15°	SE	23:19:05	58°	ENE	23:22:47	10°	N
H-2A R/B	2.5	23:17:54	14°	SSE	23:20:46	83°	WSW	23:24:16	10°	NNW
CZ-4B R/B	2.0	23:18:54	13°	SSE	23:22:37	77°	WSW	23:26:45	10°	NNW
H-2A R/B	2.0	23:37:12	16°	SSE	23:41:17	84°	ENE	23:46:17	10°	NNW
Cosmos 1151	3.0	23:45:19	10°	SSW	23:48:28	53°	WNW	23:51:40	10°	N
IGS 1A	2.7	23:53:59	16°	SSW	23:56:21	43°	W	23:59:33	10°	NNW

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 2297 Rocket	2.1	00:22:31	10°	SSW	00:28:11	77°	SE	00:33:52	10°	NE
Cosmos 1953	2.7	00:29:19	25°	SSE	00:31:23	50°	E	00:35:24	10°	NNE
Coronas F rocket	2.0	00:48:38	25°	SSW	00:50:21	68°	WNW	00:53:38	10°	N
TITAN 4B R/B	2.9	00:58:51	20°	SE	00:58:51	20°	SE	01:01:29	10°	E
Lacrosse 4	2.9	01:02:30	10°	NW	01:07:08	44°	NNE	01:11:46	10°	E
Cosmos 1315	2.9	01:06:37	10°	NNW	01:10:09	87°	WSW	01:11:33	35°	SSE
Cosmos 1340	2.7	01:50:08	31°	SSW	01:51:57	84°	ESE	01:55:55	10°	NNE
Cosmos 1437 Rocket	3.0	01:49:33	10°	NNW	01:53:45	76°	ENE	01:56:05	26°	SSE
Cosmos 1674	2.8	01:51:54	10°	NNW	01:55:59	86°	ENE	01:58:00	29°	SSE
Cosmos 1733 Rocket	3.0	02:04:01	10°	NNW	02:08:23	84°	WSW	02:10:43	27°	S
Cosmos 2082 Rocket	2.5	02:10:30	10°	NW	02:16:09	69°	NE	02:21:46	10°	SE
Cosmos 2263 Rocket	2.7	02:19:20	23°	S	02:22:26	45°	ESE	02:27:47	10°	NE
Cosmos 1470	2.8	02:27:19	29°	SSW	02:29:17	86°	WNW	02:33:19	10°	NNE
USA 161	2.8	02:29:35	17°	SE	02:31:35	41°	ENE	02:34:30	10°	N
Cosmos 2292 Rocket	3.0	02:34:40	33°	SW	02:35:51	64°	WNW	02:39:21	10°	N
TITAN 4B R/B	1.9	02:34:58	24°	SW	02:37:08	42°	SSE	02:41:26	10°	E
Lacrosse 4	1.7	02:43:31	10°	NW	02:48:23	87°	SW	02:53:12	10°	SE
Cosmos 1222 Rocket	2.4	03:03:09	27°	S	03:04:48	71°	ESE	03:08:11	10°	NNE
Cosmos 1833 Rocket	2.9	03:04:16	10°	NW	03:09:58	76°	NE	03:15:38	10°	SE
Cosmos 1220	2.5	03:22:56	21°	S	03:24:21	30°	SE	03:27:20	10°	ENE
CENTAUR R/B	3.0	03:32:47	17°	SSW	03:37:52	56°	SE	03:44:52	10°	ENE
Cosmos 2082 Rocket	2.6	03:54:50	10°	NW	04:00:05	41°	WSW	04:05:19	10°	S
Cosmos 2263 Rocket	2.5	04:01:02	12°	WSW	04:06:19	64°	NW	04:11:57	10°	NE
Cosmos 1626	2.3	04:06:22	10°	NNW	04:10:20	89°	ENE	04:14:16	10°	SSE
TITAN 4B R/B	1.8	04:12:13	10°	W	04:16:28	48°	S	04:20:57	10°	ESE
Lacrosse 4	2.7	04:24:43	10°	WNW	04:28:43	26°	WSW	04:32:41	10°	S
Cosmos 2278 Rocket	2.3	04:34:53	10°	SW	04:40:31	83°	SE	04:46:13	10°	NE
COS B Rocket	2.7	04:43:54	10°	N	04:47:34	77°	W	04:50:25	10°	S
Cosmos 1220	1.4	04:55:47	10°	WSW	04:59:09	78°	NNW	05:02:32	10°	ENE
Cosmos 1206 Rocket	2.4	04:59:03	10°	S	05:02:10	74°	ESE	05:05:21	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Lacrosse 4	3.0	22:15:30	10°	W	22:20:10	47°	NNW	22:24:51	10°	NE
Cosmos 1242	2.9	22:35:54	10°	NNW	22:39:05	72°	WSW	22:42:14	10°	S
Cosmos 1633	2.9	22:38:28	10°	SSW	22:42:15	73°	WNW	22:46:05	10°	NNE
H-2A R/B	2.8	22:47:37	12°	SE	22:50:43	52°	ENE	22:54:08	10°	N
Cosmos 1743	2.7	22:54:08	10°	S	22:58:05	85°	ESE	23:02:02	10°	NNE
Terra	1.8	22:55:50	11°	SSE	23:00:30	82°	ENE	23:05:17	10°	NNW
Cosmos 1151	2.3	22:57:26	10°	S	23:00:36	61°	E	23:03:49	10°	NNE
CZ-4B R/B	1.9	23:01:40	12°	SSE	23:05:27	80°	ENE	23:09:35	10°	NNW
Cosmos 1346 Rocket	2.9	23:01:51	10°	S	23:05:45	56°	ESE	23:09:39	10°	NNE
H-2A R/B	2.3	23:06:44	13°	SE	23:11:07	57°	ENE	23:15:59	10°	NNW
IGS 1A	1.8	23:13:53	16°	SSE	23:16:28	78°	ENE	23:19:48	10°	NNW
Cosmos 1689 Rocket	2.8	23:43:42	18°	S	23:46:10	61°	WSW	23:49:40	10°	NNW
Cosmos 2227 Rocket	2.2	23:44:14	10°	SW	23:49:54	87°	SE	23:55:35	10°	NE
Cosmos 1666	3.0	23:50:08	19°	S	23:52:53	58°	E	23:56:53	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Coronas F rocket	1.9	00:07:04	27°	SSE	00:08:34	55°	E	00:11:47	10°	NNE
Cosmos 2297 Rocket	2.1	00:07:34	10°	SSW	00:13:14	75°	SE	00:18:55	10°	NE
Cosmos 1953	2.5	00:30:14	26°	SSE	00:32:20	59°	E	00:36:25	10°	NNE
H-2A R/B	3.0	00:47:25	17°	SSW	00:50:51	37°	W	00:55:28	10°	NNW
TITAN 4B R/B	2.6	01:00:45	25°	SE	01:00:45	25°	SE	01:04:01	10°	E
Lacrosse 4	2.3	01:38:34	10°	NW	01:43:22	60°	NNE	01:48:09	10°	ESE
Cosmos 1340	2.7	01:41:25	33°	S	01:43:08	84°	ESE	01:47:06	10°	NNE
Cosmos 1674	2.8	01:43:57	10°	NNW	01:48:02	86°	ENE	01:49:56	31°	SSE
Cosmos 1437 Rocket	2.9	01:46:09	10°	NNW	01:50:21	83°	ENE	01:52:29	29°	SSE
Cosmos 2082 Rocket	2.5	01:56:09	10°	NW	02:01:47	67°	NE	02:07:24	10°	SE
Cosmos 2263 Rocket	2.8	02:03:04	25°	S	02:05:54	43°	ESE	02:11:12	10°	NE
Helios 1B rocket	2.9	02:18:50	18°	SE	02:21:56	63°	ENE	02:26:11	10°	NNW
Cosmos 1470	2.8	02:23:48	30°	SSW	02:25:41	80°	WNW	02:29:43	10°	NNE
TITAN 4B R/B	1.8	02:36:52	21°	SW	02:39:27	45°	S	02:43:49	10°	E
Cosmos 1833 Rocket	2.9	02:47:43	10°	NW	02:53:25	74°	NE	02:59:04	10°	SE
SL-8 R/B	2.9	02:51:19	10°	NNE	02:54:28	64°	WNW	02:55:45	31°	SW
USA 161	1.5	03:07:49	27°	S	03:09:20	81°	WSW	03:12:24	10°	NNW
ATLAS 3B R/B	3.0	03:08:08	10°	WNW	03:15:58	67°	SW	03:23:31	10°	SE
Lacrosse 4	1.9	03:19:32	10°	NW	03:24:12	50°	SW	03:28:50	10°	SSE
Cosmos 2082 Rocket	2.6	03:40:28	10°	NW	03:45:44	42°	WSW	03:51:00	10°	S
Cosmos 2263 Rocket	2.5	03:44:46	13°	WSW	03:49:44	66°	NW	03:55:23	10°	NE
Cosmos 1626	2.3	03:55:48	10°	NNW	03:59:45	85°	ENE	04:03:41	10°	SSE
Cosmos 1220	1.3	04:02:18	18°	SW	04:04:40	69°	SE	04:08:02	10°	ENE
TITAN 4B R/B	1.9	04:14:34	10°	W	04:18:48	45°	S	04:23:15	10°	ESE
Cosmos 2278 Rocket	2.3	04:20:53	12°	SW	04:26:05	81°	SE	04:31:47	10°	NE
Lacrosse 5	2.5	04:22:29	13°	SW	04:26:42	41°	SSE	04:31:26	10°	E
CENTAUR R/B	2.8	04:33:32	10°	WSW	04:40:16	86°	SSE	04:47:39	10°	ENE
Cosmos 1844 Rocket	2.8	04:47:24	10°	SW	04:53:00	76°	NW	04:58:39	10°	NE
ATLAS 5 CENTAUR R/B	2.5	04:59:05	10°	SW	05:04:33	63°	SE	05:10:17	10°	ENE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Cosmos 1633	2.8	22:25:07	10°	SSW	22:28:55	81°	WNW	22:32:45	10°	NNE
IGS 1A	2.9	22:33:46	10°	SE	22:36:45	34°	ENE	22:39:47	10°	N
H-2A R/B	2.8	22:36:26	10°	ESE	22:41:04	39°	NE	22:45:38	10°	N
CZ-4B R/B	2.1	22:44:26	11°	SE	22:48:19	59°	ENE	22:52:22	10°	NNW
Cosmos 1743	2.7	22:47:32	10°	SSW	22:51:29	86°	ESE	22:55:27	10°	NNE
Cosmos-2242	3.0	22:52:43	10°	S	22:57:01	84°	ESE	23:01:21	10°	NNE
Cosmos 1346 Rocket	2.8	22:59:22	10°	S	23:03:18	63°	ESE	23:07:14	10°	NNE
Cosmos 1689 Rocket	2.5	23:18:16	17°	SSE	23:20:52	80°	ENE	23:24:24	10°	NNW
Cosmos 2227 Rocket	2.2	23:29:28	10°	SW	23:35:08	85°	SE	23:40:49	10°	NE
Terra	2.4	23:39:12	13°	S	23:43:22	53°	WSW	23:48:04	10°	NNW
Cosmos 1666	2.9	23:42:26	18°	S	23:45:18	58°	E	23:49:17	10°	NNE

Month Day Morning Evening

Minimum brightness: 3.0 3.5 4.0 4.5 5.0

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Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
H-2A R/B	2.4	00:16:57	19°	S	00:20:27	57°	WSW	00:25:21	10°	NNW
Cosmos 1953	2.4	00:31:08	27°	S	00:33:17	69°	E	00:37:25	10°	NNE
Cosmos 2058	3.0	00:30:25	10°	NNW	00:34:45	90°	W	00:37:01	28°	SSE
Lacrosse 4	2.9	00:33:32	10°	NW	00:38:11	44°	NNE	00:42:49	10°	E
TITAN 4B R/B	2.2	01:02:35	30°	SSE	01:02:37	30°	SSE	01:06:30	10°	E
Cosmos 1340	2.7	01:32:41	34°	S	01:34:19	83°	ESE	01:38:17	10°	NNE
Cosmos 1674	2.8	01:36:00	10°	NNW	01:40:05	86°	ENE	01:41:52	33°	SSE
Cosmos 2082 Rocket	2.5	01:41:47	10°	NW	01:47:24	66°	NE	01:53:02	10°	ESE
Cosmos 1437 Rocket	2.9	01:42:44	10°	NNW	01:46:57	90°	ENE	01:48:53	31°	SSE
Cosmos 2263 Rocket	2.8	01:46:47	26°	SSE	01:49:23	41°	ESE	01:54:38	10°	NE
SL-8 R/B	3.0	01:46:30	10°	NNE	01:49:48	61°	ESE	01:50:40	42°	SSE
Lacrosse 4	1.7	02:14:34	10°	NW	02:19:26	87°	SW	02:24:15	10°	SE
Cosmos 1470	2.8	02:20:16	31°	SSW	02:22:04	74°	WNW	02:26:06	10°	NNE
ATLAS 3B R/B	3.0	02:20:56	10°	WNW	02:28:53	79°	SSW	02:36:34	10°	SE
Helios 1B rocket	2.6	02:31:27	21°	SSE	02:34:18	77°	ENE	02:38:35	10°	NNW
Cosmos 1833 Rocket	3.0	02:31:11	10°	NW	02:36:52	71°	NE	02:42:30	10°	SE
TITAN 4B R/B	1.7	02:38:42	17°	WSW	02:41:47	48°	S	02:46:11	10°	E
Cosmos 1220	1.9	03:09:09	30°	S	03:10:15	40°	SE	03:13:27	10°	ENE
Cosmos 1222 Rocket	2.6	03:16:32	28°	SW	03:18:07	59°	WNW	03:21:29	10°	NNE
Cosmos 2082 Rocket	2.6	03:26:06	10°	NW	03:31:23	43°	WSW	03:36:01	13°	S
Cosmos 2263 Rocket	2.4	03:28:28	15°	SW	03:33:09	69°	NW	03:38:49	10°	NE
Lacrosse 5	2.7	03:29:29	20°	SSW	03:32:08	33°	SSE	03:36:38	10°	E
USA 161	2.5	03:46:01	24°	SW	03:47:13	32°	W	03:50:01	10°	NNW
Cosmos 1626	2.3	03:45:13	10°	NNW	03:49:11	81°	ENE	03:53:06	10°	SSE
CENTAUR R/B	2.8	03:46:31	15°	SW	03:52:12	73°	SSE	03:59:28	10°	ENE
Lacrosse 4	2.7	03:55:46	10°	WNW	03:59:46	27°	WSW	04:02:57	14°	SSW
Cosmos 2278 Rocket	2.3	04:06:52	15°	SSW	04:11:40	80°	SE	04:17:21	10°	NE
TITAN 4B R/B	2.0	04:16:56	10°	W	04:21:07	42°	SSW	04:25:31	10°	SE
Cosmos 1844 Rocket	2.8	04:30:43	12°	SW	04:36:00	79°	NW	04:41:39	10°	NE
ATLAS 5 CENTAUR R/B	2.4	04:40:53	11°	SW	04:46:13	62°	SE	04:51:56	10°	ENE
Cosmos 1220	1.6	04:41:52	10°	WSW	04:45:13	64°	NNW	04:48:34	10°	ENE
Okean O Rocket	2.5	04:45:16	10°	NNE	04:49:40	50°	E	04:54:01	10°	S
Cosmos 1206 Rocket	2.2	04:45:44	10°	SSW	04:48:52	82°	ESE	04:52:03	10°	NNE
CZ-2C R/B	2.9	05:01:07	10°	NNE	05:06:46	83°	ESE	05:12:25	10°	SSW

Объявления

1) Все выпуски Астрономической газеты, приложений к ней и выпуски «Астрономия в Карелии» собраны в одном месте, в архиве:
http://urfak.petrSU.ru/astronomy_archive/

2) Вас интересует качественное юридическое образование?

Добро пожаловать на официальный сайт юридического факультета ПетрГУ:

www.urfak.petrSU.ru

<http://юрфак.петргу.рф/>

3) Если Вы хотите поддержать развитие научных исследований в области астрономии - можете подключить Ваши компьютеры к одному из проектов распределённых вычислений:

Asteroids@home

определение формы и параметров вращения астероидов по данным фотометрических наблюдений

<http://asteroidsathome.net/boinc/>

Constellation

оптимизация траекторий космических аппаратов

<http://aerospaceresearch.net/constellation/>

the SkyNet POGS

создание многоволнового атласа ближайшей Вселенной в ультрафиолетовом, оптическом и инфракрасном диапазонах

<http://pogs.theskynet.org/pogs/>

Принять участие в проектах распределённых вычислений может каждый. Для этого достаточно иметь современный компьютер и постоянное подключение к Интернету. Задания на компьютере выполняются на низком приоритете в фоновом режиме (в то время когда процессор не загружен другой работой) и, поэтому, незаметно для пользователя. На компьютер нужно установить программную оболочку BOINC, которую можно загрузить с официального сайта BOINC <http://boinc.berkeley.edu/>

Присоединяйте Ваши компьютеры к новым проектам распределённых вычислений, ведущим исследования в области астрономии! Поможем продвижению науки!

Помощь и поддержка по распределённым вычислениям: <http://vk.com/boinc>