THE FUTURE PLANS OF THE POLISH FIREBALL NETWORK

Przemysław Żołądek

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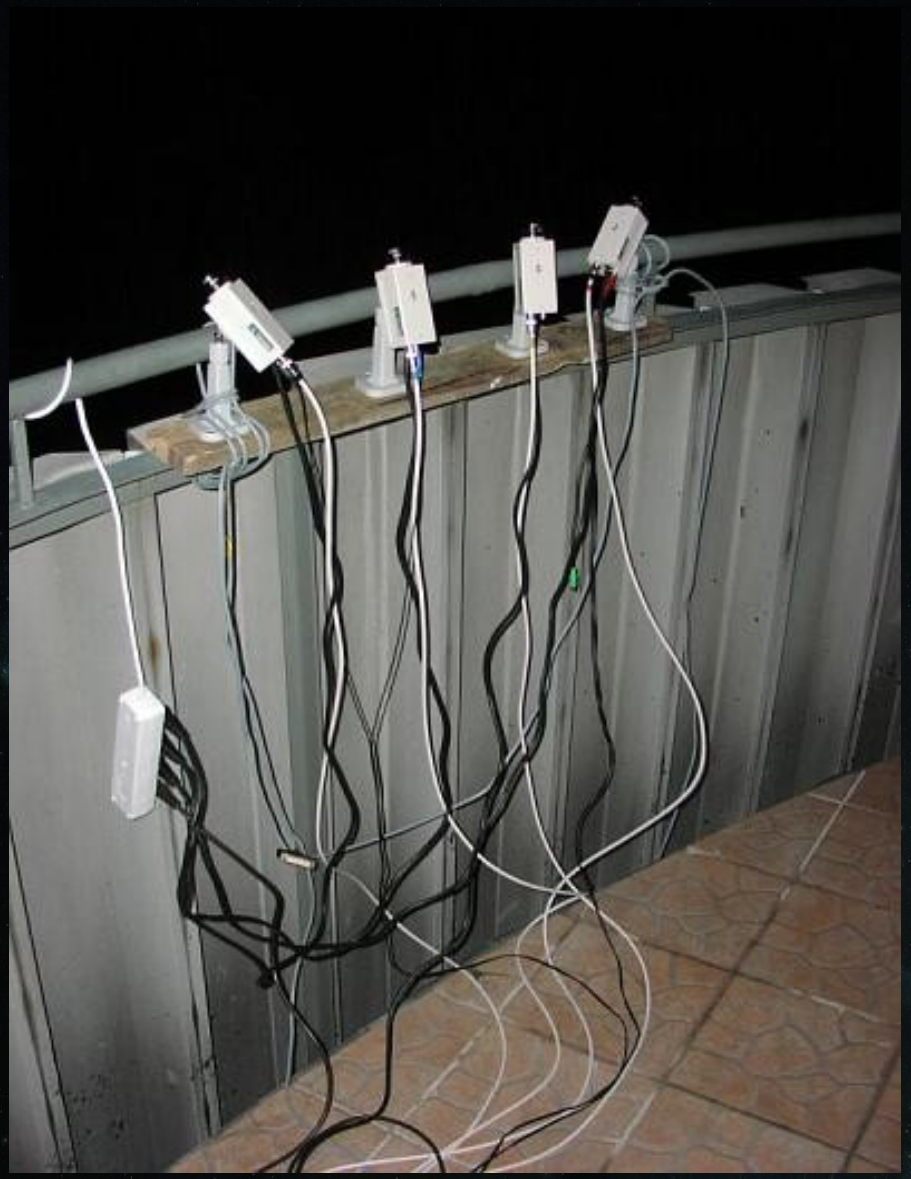
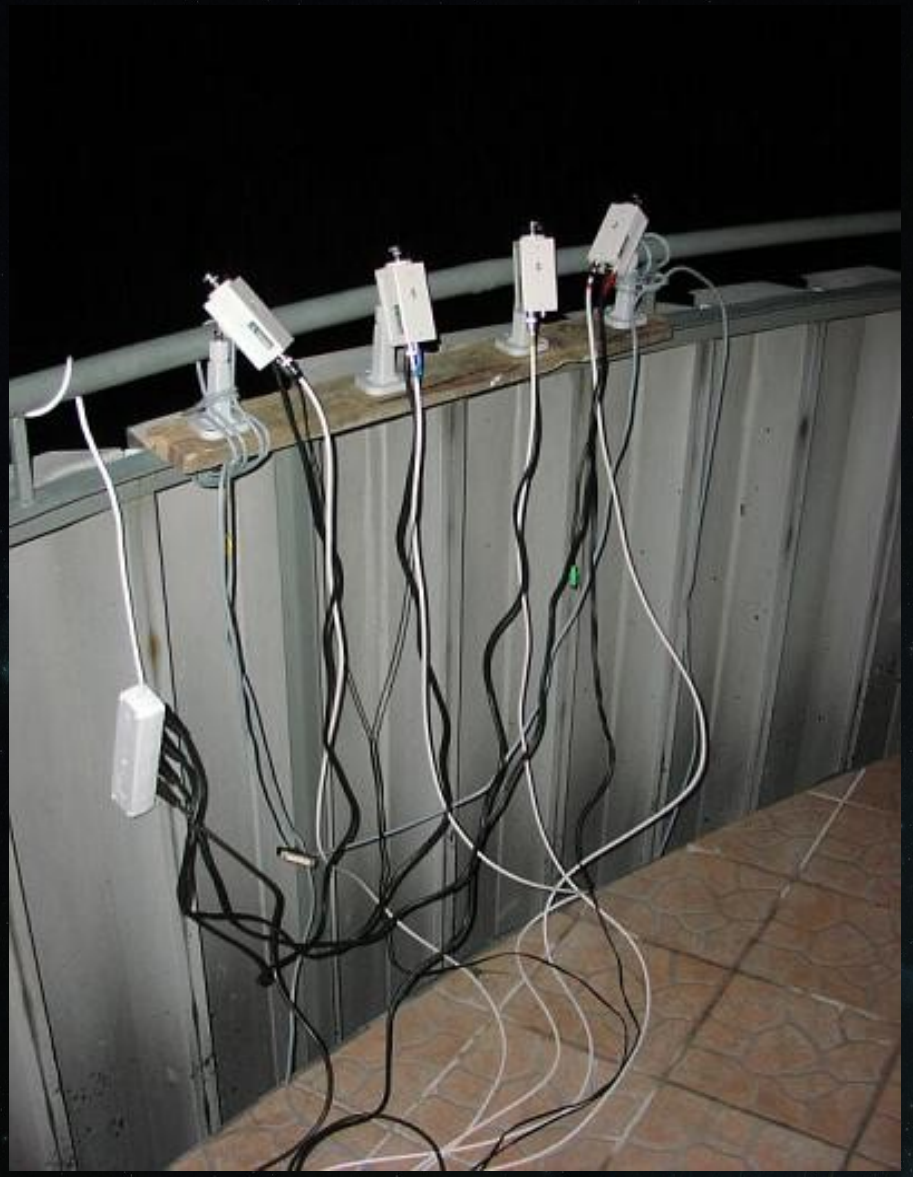
POLISH FIREBALL NETWORK – FOUNDED 10 YEARS AGO



POLISH FIREBALL NETWORK – FOUNDED 10 YEARS AGO – EN200204 „Łaskarzew”

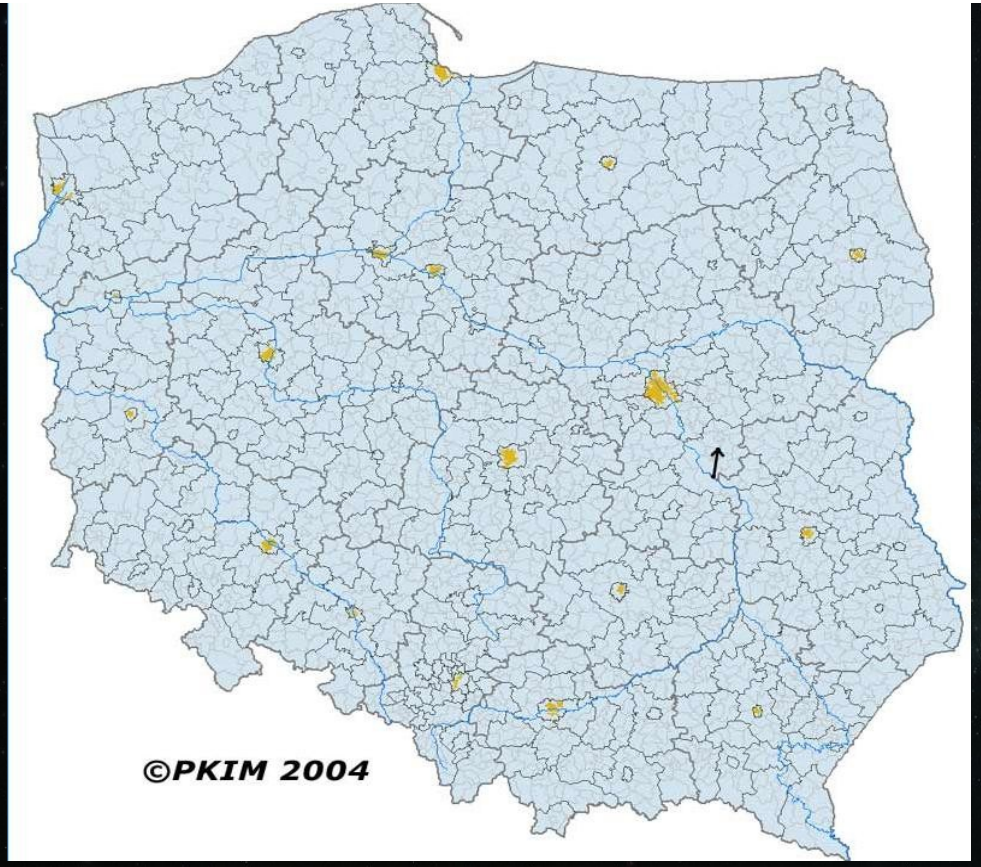


Trajectory and orbit of the EN200204 Łaskarzew fireball

Pavel Spurný [1], *Arkadiusz Olech* [2] *and Piotr Kędzierski* [3]

A fireball of magnitude approximately −10 was observed over Poland on 2004 February 20 at $18^{h}54^{m}$ UT. In addition to many visual observations, the event was caught by two photographic stations: one in the Czech Republic and one in Poland. A description, ground track map, atmospheric trajectory and orbital data for the fireball are presented.

Received 2004 March 31



PFN 10 YEARS LATER

PFN CCTV CAMERAS

Tayama 3102 & 4702 – 41 pcs.

Mintron MTV23X11C – 12 pcs.

Fuho – 5 pcs.

Watec 902 – 5 pcs.

Mintron 12V6 – 4 pcs.

Siemens CCBB1320 – 7 pcs.

PFN CCTV CAMERAS ~ 30% PURCHASED FROM SIEMENS FUNDINGS

Tayama 3102 & 4702 – 41 pcs.

Mintron MTV23X11C – 12 pcs.

Fuho – 5 pcs.

Watec 902 – 5 pcs.

Mintron 12V6 – 4 pcs.

Siemens CCBB1320 – 7 pcs.

PFN CCTV CAMERAS ~ 4 TAYAMAS PURCHASED FROM OLD NATIONAL GRANT

Tayama 3102 & 4702 – 41 pcs.

Mintron MTV23X11C – 12 pcs.

Fuho – 5 pcs.

Watec 902 – 5 pcs.

Mintron 12V6 – 4 pcs.

Siemens CCBB1320 – 7 pcs.

PFN CCTV CAMERAS ~ MOST OF EQUIPMENT FOUNDED BY PFN OBSERVERS

Tayama 3102 & 4702 – 41 pcs.

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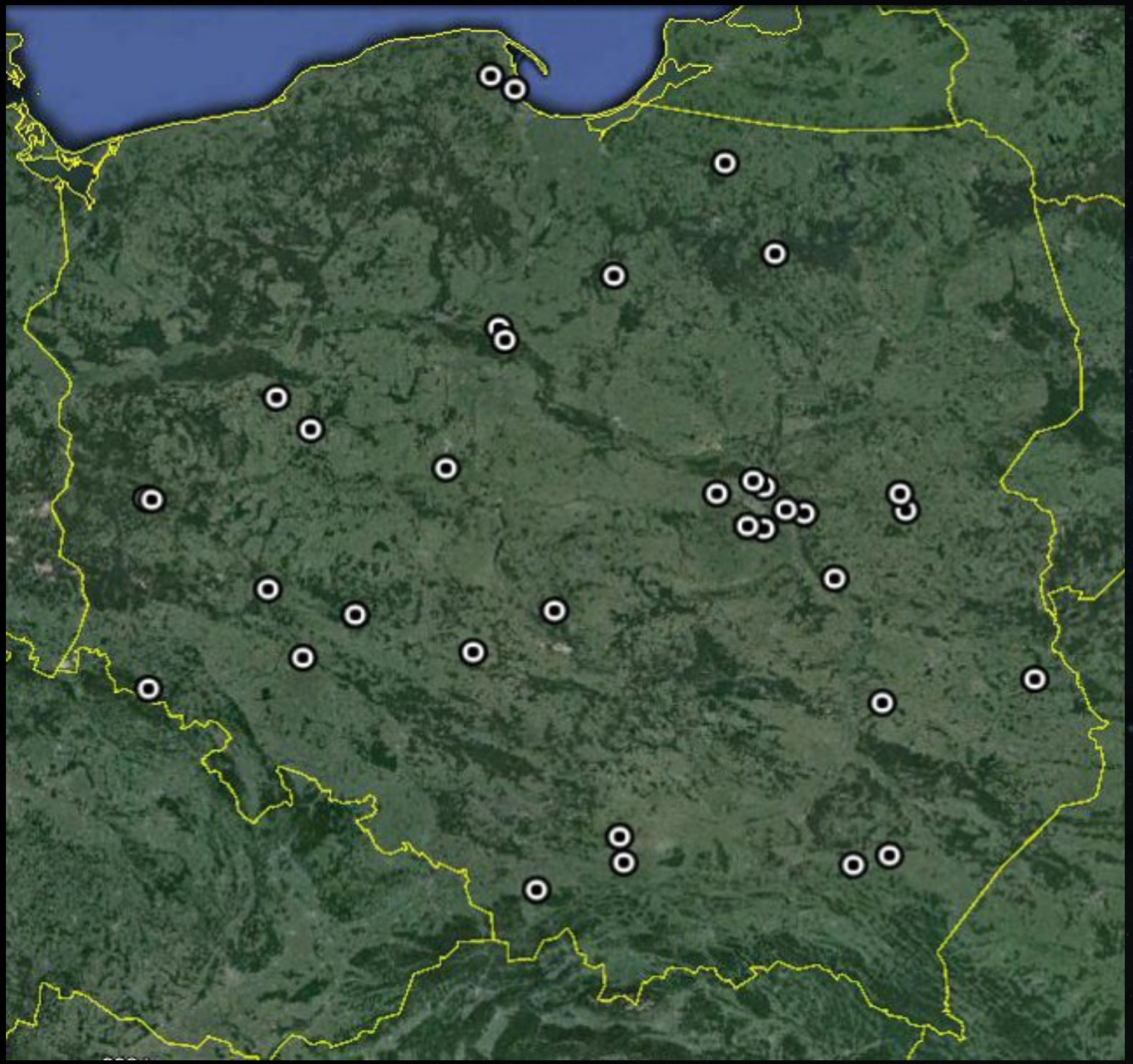
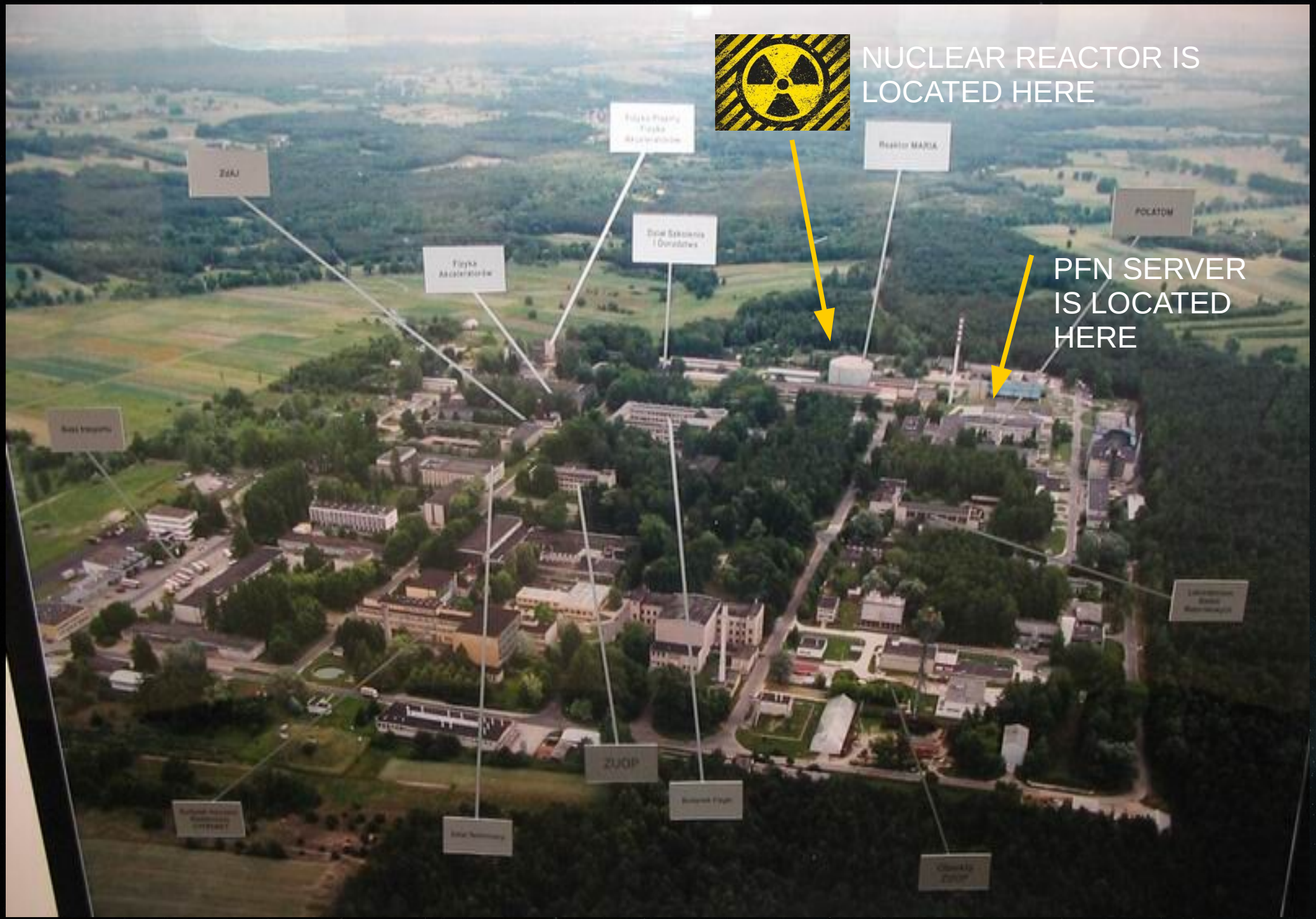
PFN 10 YEARS LATER

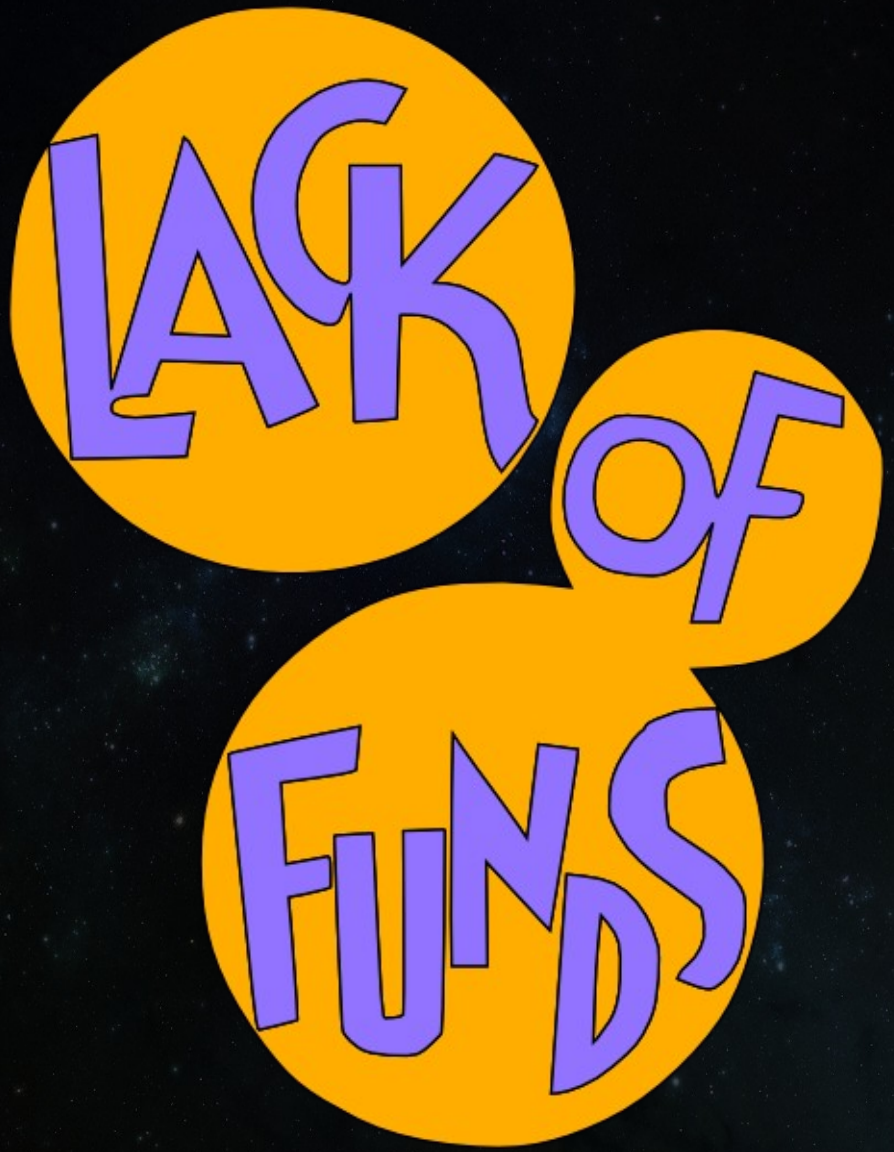


DATA STORAGE AT NATIONAL CENTRE FOR NUCLEAR RESEARCH, ŚWIERK



AND SUCCESSFUL INTERNATIONAL COOPERATION IS GOING ON :)

THERE WAS ONE SERIOUS PROBLEM
DURING THESE 10 YEARS:



NOVEMBER 2013 – GREAT NEWS

Lp	Tytuł projektu	Kierownik projektu	Nazwa podmiotu	Przyznane środki (PLN)
1	Olbrzymy w układach zaćmieniowych jako doskonałe laboratorium astrofizyczne	dr hab. Grzegorz Pietrzyński	Uniwersytet Warszawski; Wydział Fizyki	639 000
2	Polska Sieć Bolidowa	dr hab. Arkadiusz Kamil Olech	Centrum Astronomiczne im. Mikołaja Kopernika PAN	556 600
3	Badania najbliższego sąsiedztwa Sgr A*: spin, błyski i inne obiekty zwarte	dr Frederic H Vincent	Centrum Astronomiczne im. Mikołaja Kopernika PAN	195 900
4	Badanie najistotniejszych czynników kształtujących pogodę kosmiczną	dr hab. Grzegorz Józef Michałek	Uniwersytet Jagielloński; Wydział Fizyki, Astronomii i Informatyki Stosowanej	195 840
5	Widma typu GPS w magnetarach i pulsarach - wpływ własności ośrodka międzygwiazdowego na promieniowanie radiowe	dr hab. Jarosław Sławomir Kijak	Uniwersytet Zielonogórski; Wydział Fizyki i Astronomii	419 100
6	Dlaczego tylko niektóre kwazary są radiowo głośne?	dr Dorota Kozieł-Wierzbowska	Uniwersytet Jagielloński; Wydział Fizyki, Astronomii i Informatyki Stosowanej	561 700
7	Ewolucja dynamiczna radiogalaktyk - badanie obiektów z wielokrotnymi stanami aktywności	dr Marek Tomasz Jamrozy	Uniwersytet Jagielloński; Wydział Fizyki, Astronomii i Informatyki Stosowanej	776 860

...

PFN GOT NATIONAL GRANT: 130 000 €

DETAILS:

FUNDS AVAILABLE FROM 2014 TO 2017

EQUIPMENT: 30 000 €

OTHER EXPENSES (CONFERENCES, EXPEDITIONS, SPARE PARTS ETC): 50 000 €

SALARIES: 30 000 €

TAXES ETC. : 25 000 €

THE NEW NETWORK OF MEGAPIXEL CAMERAS

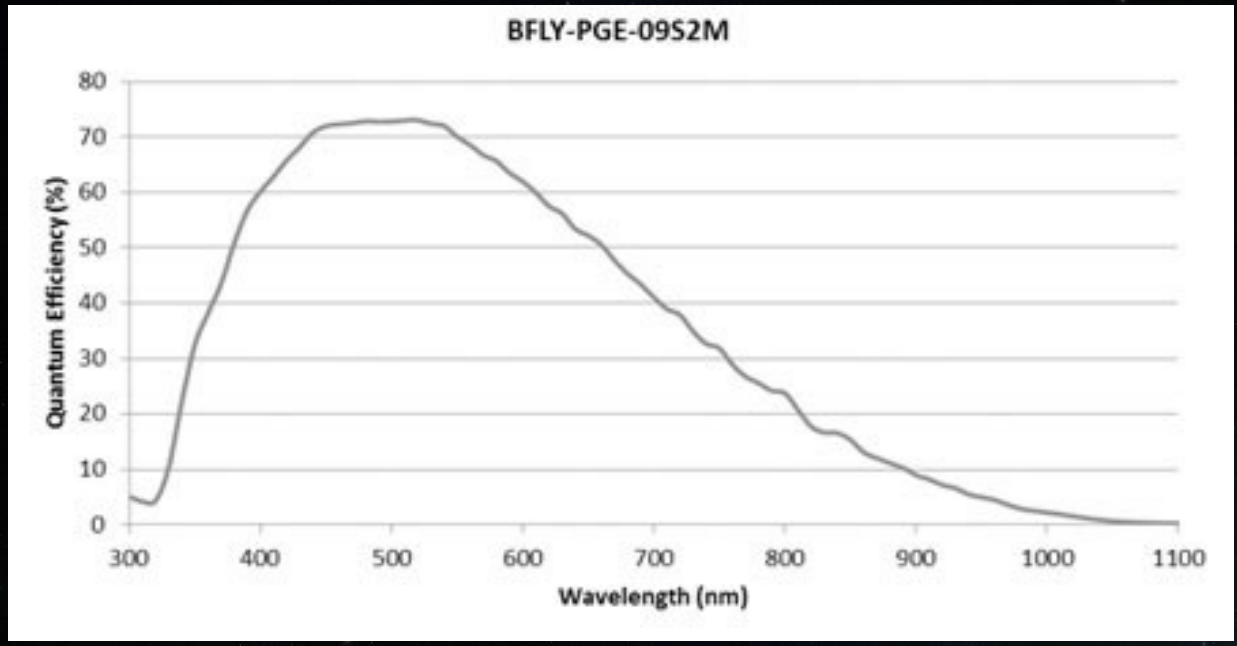
RECENTLY THE SENSITIVE MEGAPIXEL CAMERAS APPEARED – USABLE FOR METEOR DETECTION

CCD BASED – POINTGREY

Black Fly 0.9 Mono

- Sony ICX 692
- 1288 x 728 pixels
- 8bit / 12 bit
- 30fps at full resolution
- GIGE Interface

~ 400 €



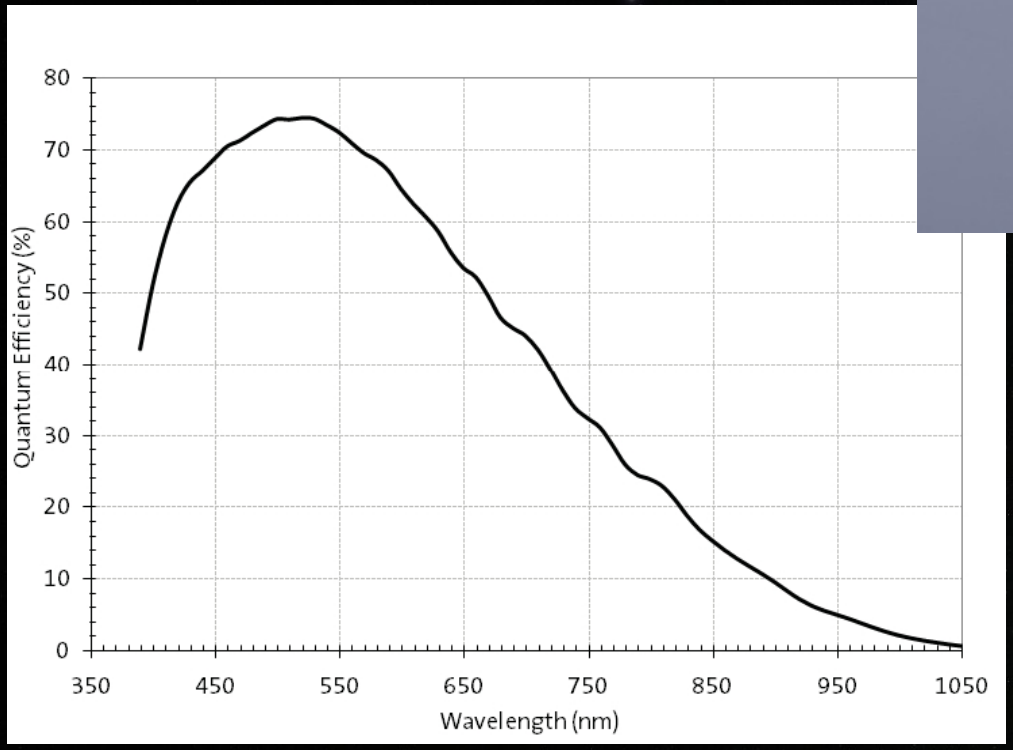
THE NEW NETWORK OF MEGAPIXEL CAMERAS

RECENTLY THE SENSITIVE MEGAPIXEL CAMERAS APPEARED – USABLE FOR METEOR DETECTION

CMOS BASED – QHY 5 L-II

- Aptina MT9M034 – QE max: 74%
- 1280 x 960 pixels
- 8bit / 14 bit
- 30fps at full resolution

~ 300 €



THE NEW NETWORK OF MEGAPIXEL CAMERAS

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CMOS BASED – ZWO ASI 120 MM

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- 1280 x 960 pixels
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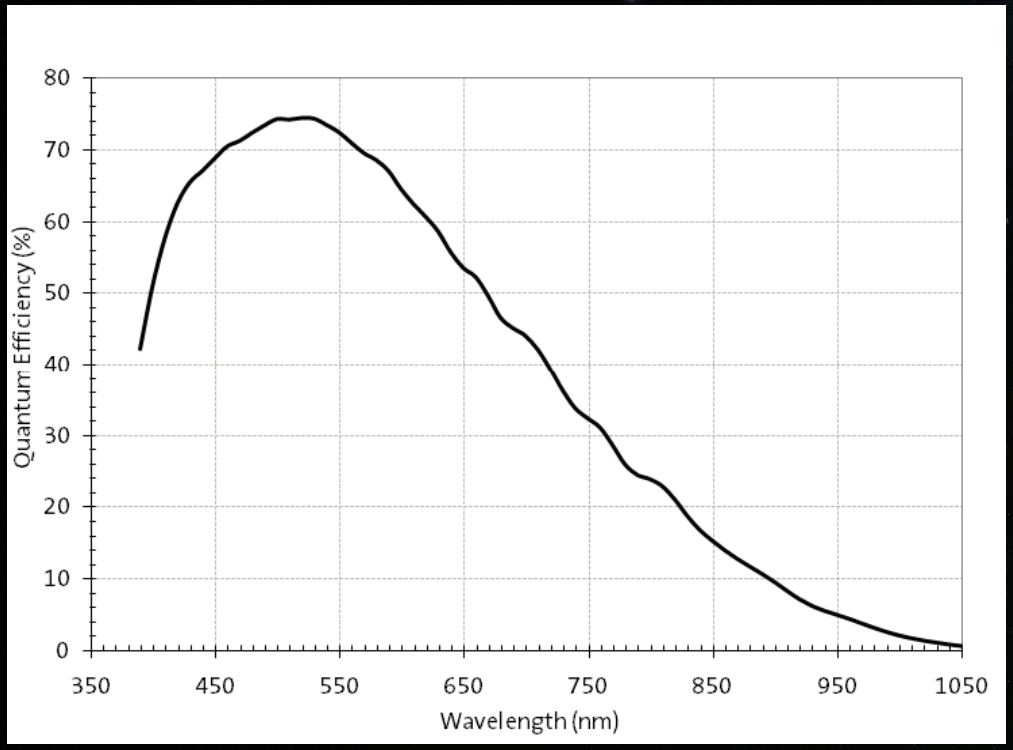
- 30fps at full resolution

~ 300 €



FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

Camelopardalids maximum, Canada, Willow Bank

First look

Connected to megapixel fisheye lens Fujinon 1.4mm f/1.6

- It doesn't need DC adapter – powered from USB

- Good backfocus distance

- Rigid housing

FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

Camelopardalids maximum, Canada, Willow Bank

FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

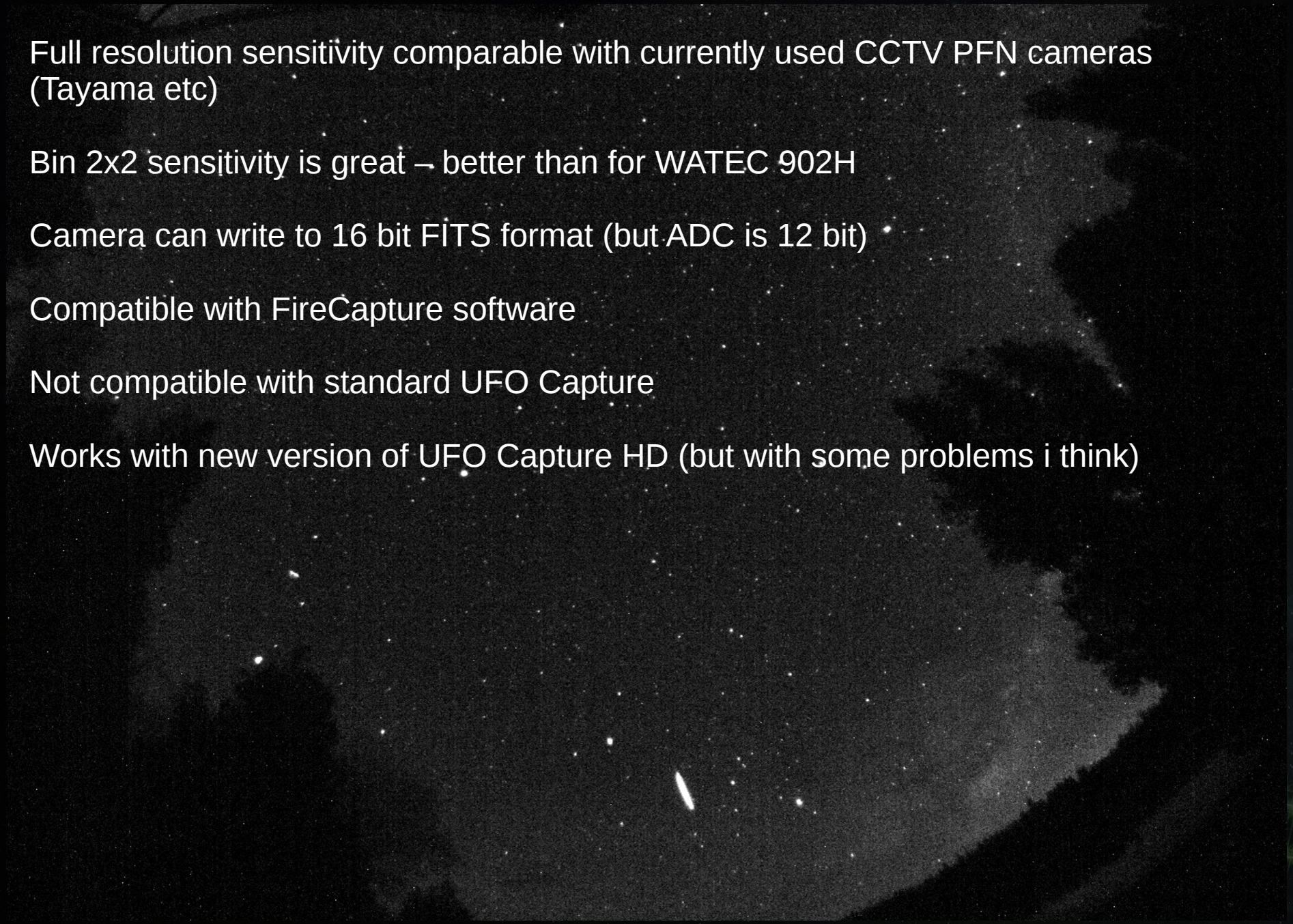
5s exposure, full gain, Fujinon 1.4 f/1.6

FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

1s exposure, full gain, -3 magnitude Camelopardalid meteor

FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

1s exposure, full gain, -3 magnitude Camelopardalid meteor



Full resolution sensitivity comparable with currently used CCTV PFN cameras (Tayama etc)

Bin 2x2 sensitivity is great – better than for WATEC 902H

Camera can write to 16 bit FİTS format (but ADC is 12 bit)

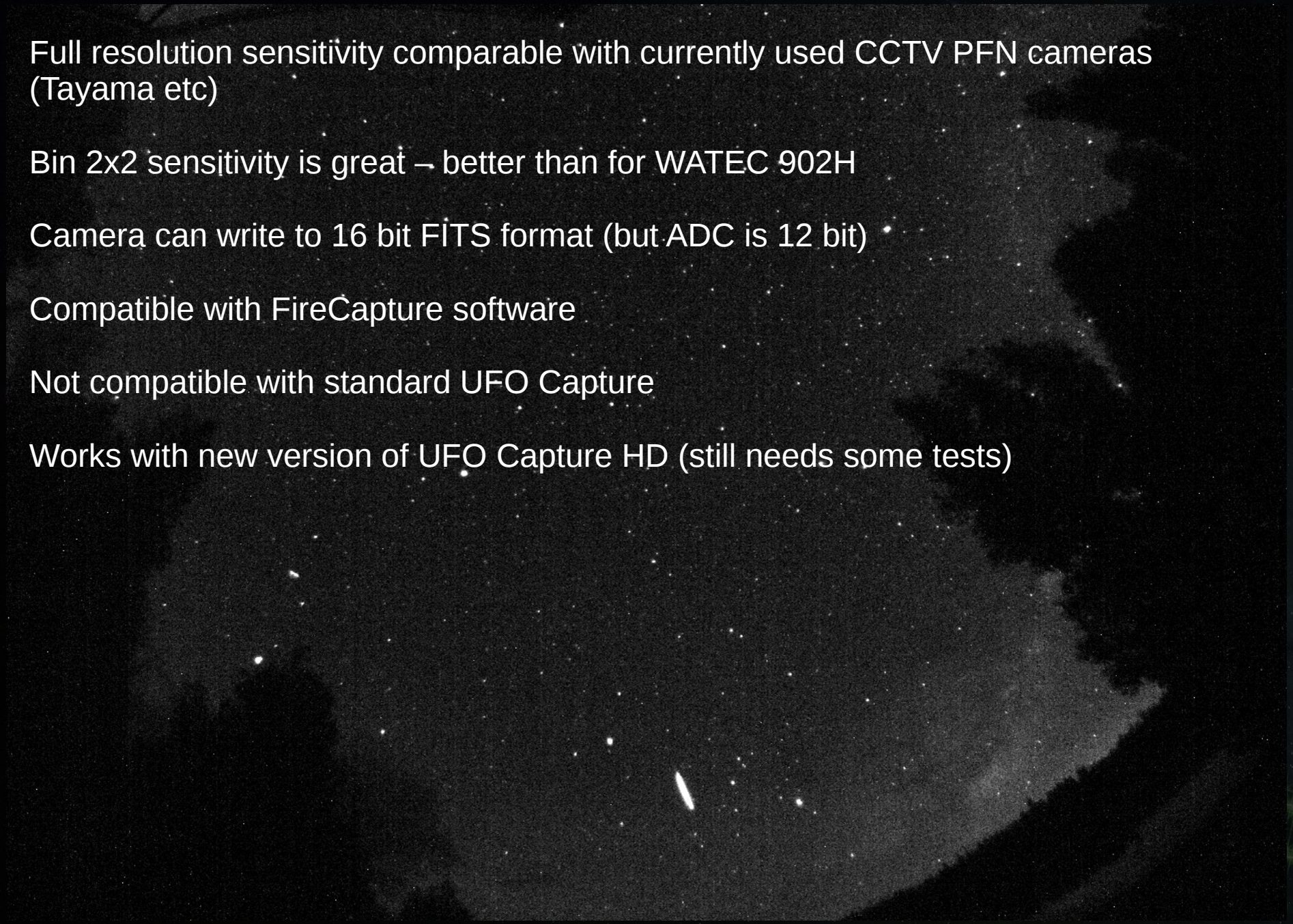
Compatible with FireCapture software

Not compatible with standard UFO Capture

Works with new version of UFO Capture HD (but with some problems i think)

FIRST TESTS: ZWO ASI 120 MM, (special thanks to Roman Piffl)

1s exposure, full gain, -3 magnitude Camelopardalid meteor



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Compatible with FireCapture software

Not compatible with standard UFO Capture

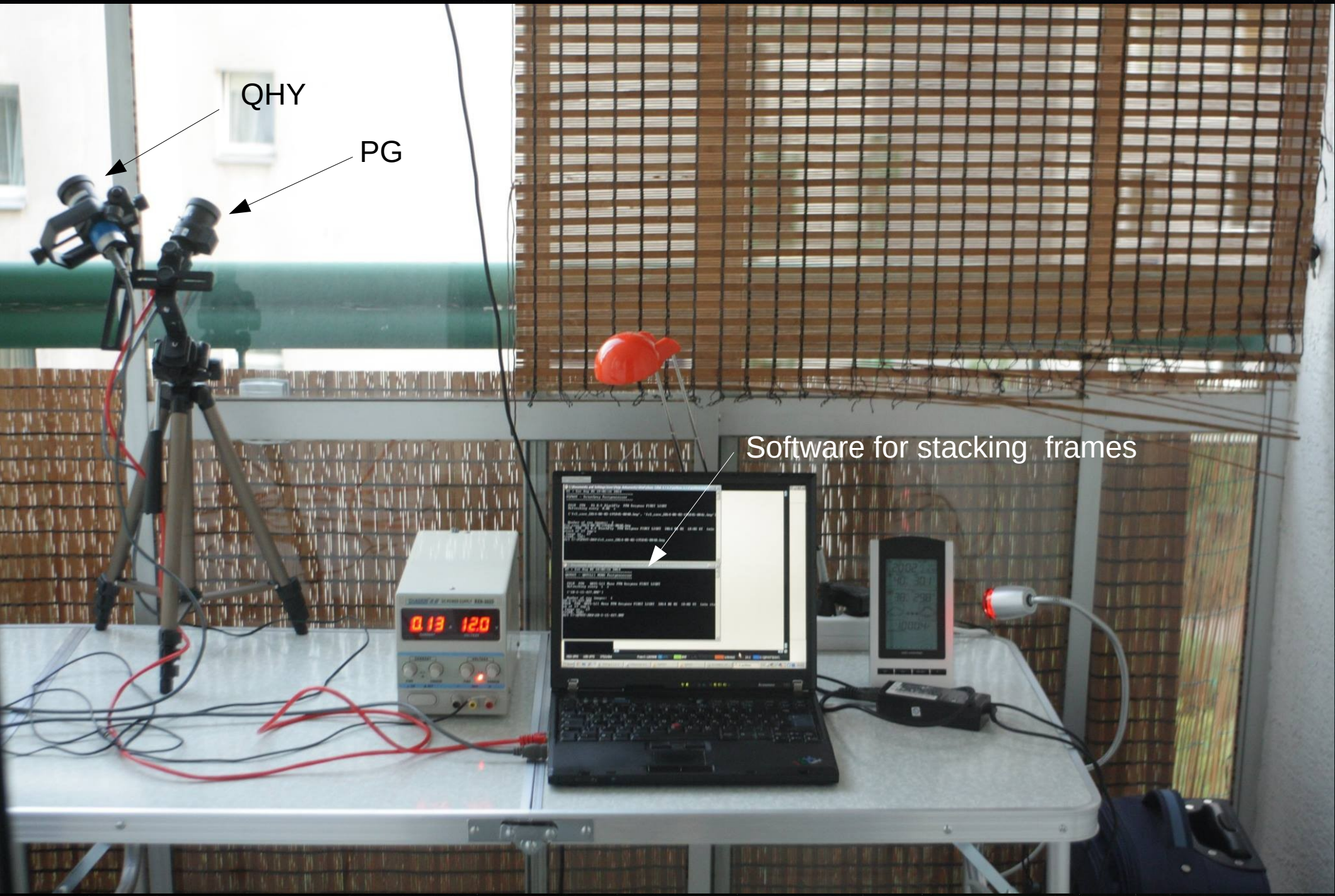
Works with new version of UFO Capture HD (still needs some tests)

POINTGREY BLACKFLY 0.9 MPix MONO – THE SAME NIGHT, WITH SPECTRAL GRATING

1s exposure, 3-8mm Tamron MpiX lens @4.5 mm f/1.0

Less sensitive than ZWO ASI120MM.
Great software, horrible drivers. Working on Linux but with problems
SDK included. NOT COMPATIBLE WITH UFO AT ALL

QHY 5L-II Mono and Pointgrey BlackFly 0.9 Mono – test in PFN 55 Ursynow station



STATISTICS:

Night	QHY meteors	QHY spectrum	PG meteors	PG spectrum
02/03 08 2014	2	0	3	0
03/04 08 2014	4	1	2	0
04/05 08 2014	8	0	4	1
05/06 08 2014	1	0	0	0
09/10 08 2014	9	0	2	0
10/11 08 2014	7	0	2	0
12/13 08 2014	8	0	9	0
14/15 08 2014	0	0	2	0
15/16 08 2014	2	0	4	0
17/18 08 2014	1	0	1	0
19/20 08 2014	2	0	3	0
20/21 08 2014	6	0	6	0
21/22 08 2014	8	2	6	2
05/06 09 2014	7	1	1	0
06/07 09 2014	5 (bin 2x2)	0	2 (2.6mm f/1.0)	0
SUMMARY:	70	4	50	3

POINTGREY 0.9 – EXAMPLE OF FIREBALL WITH SPECTRUM (120 x 0.5s)

QHY 5 L II – EXAMPLE OF FIREBALL WITH SPECTRUM (116 x 0.5s)

QHY5 LII – EXAMPLE OF FIREBALL WITH SPECTRUM (DAMAGED GRATING, 120 x 0.5s)

QHY5 LII – MAX LIMITING MAGNITUDE IN THE CITY (120 x 0.5s)

QHY5 LII – TEST OF THE BINNING 2x2 MODE (240 x 0.25s)

QHY5 LII – TEST WITH 2.6mm f/1.0 (60 x 1s)

2014 09 16 02:41 UT

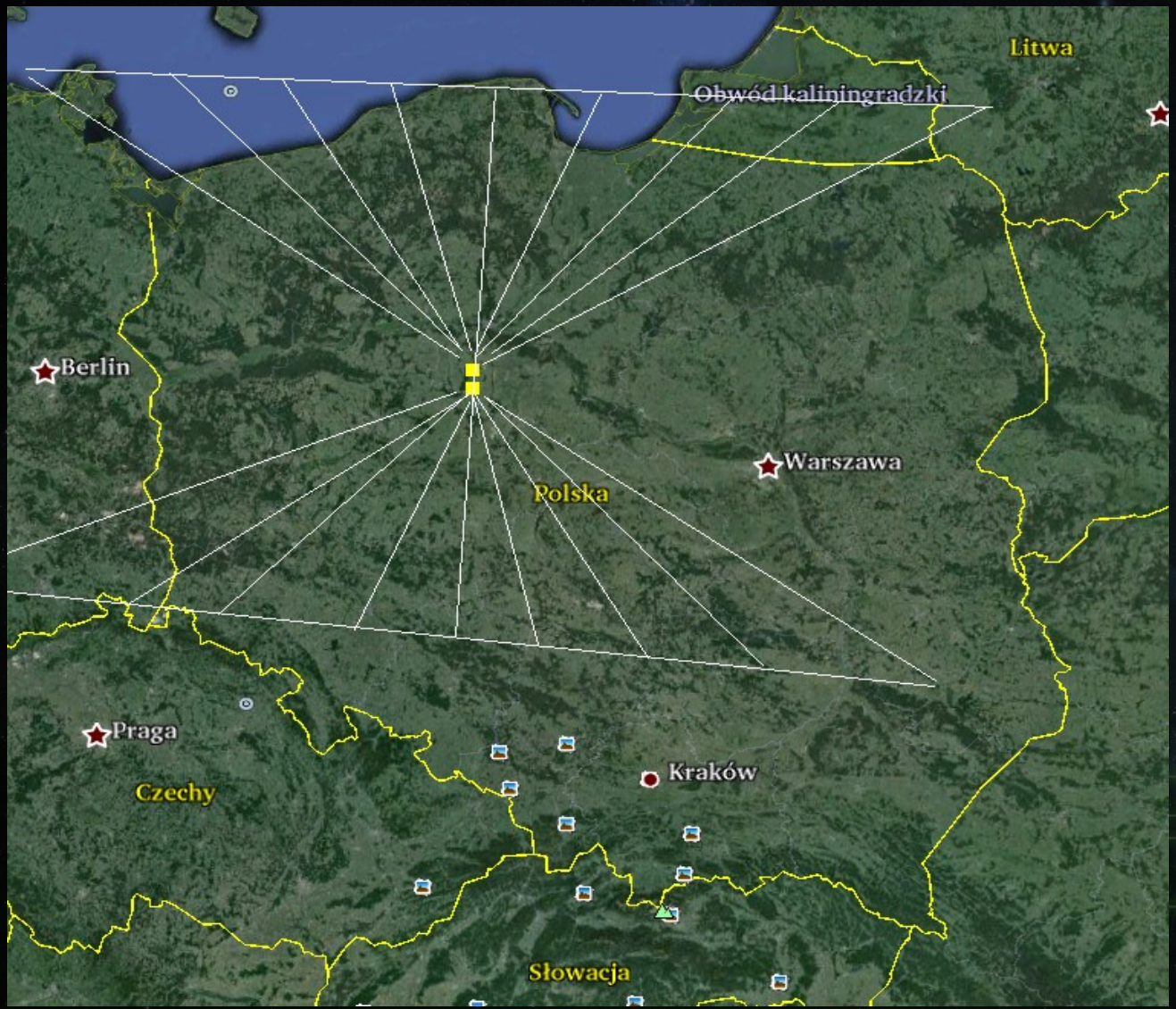
2014 09 16 02:41 UT

TYPICAL MEGAPIXEL FIREBALL STATION – COST ~ 1500 EUR

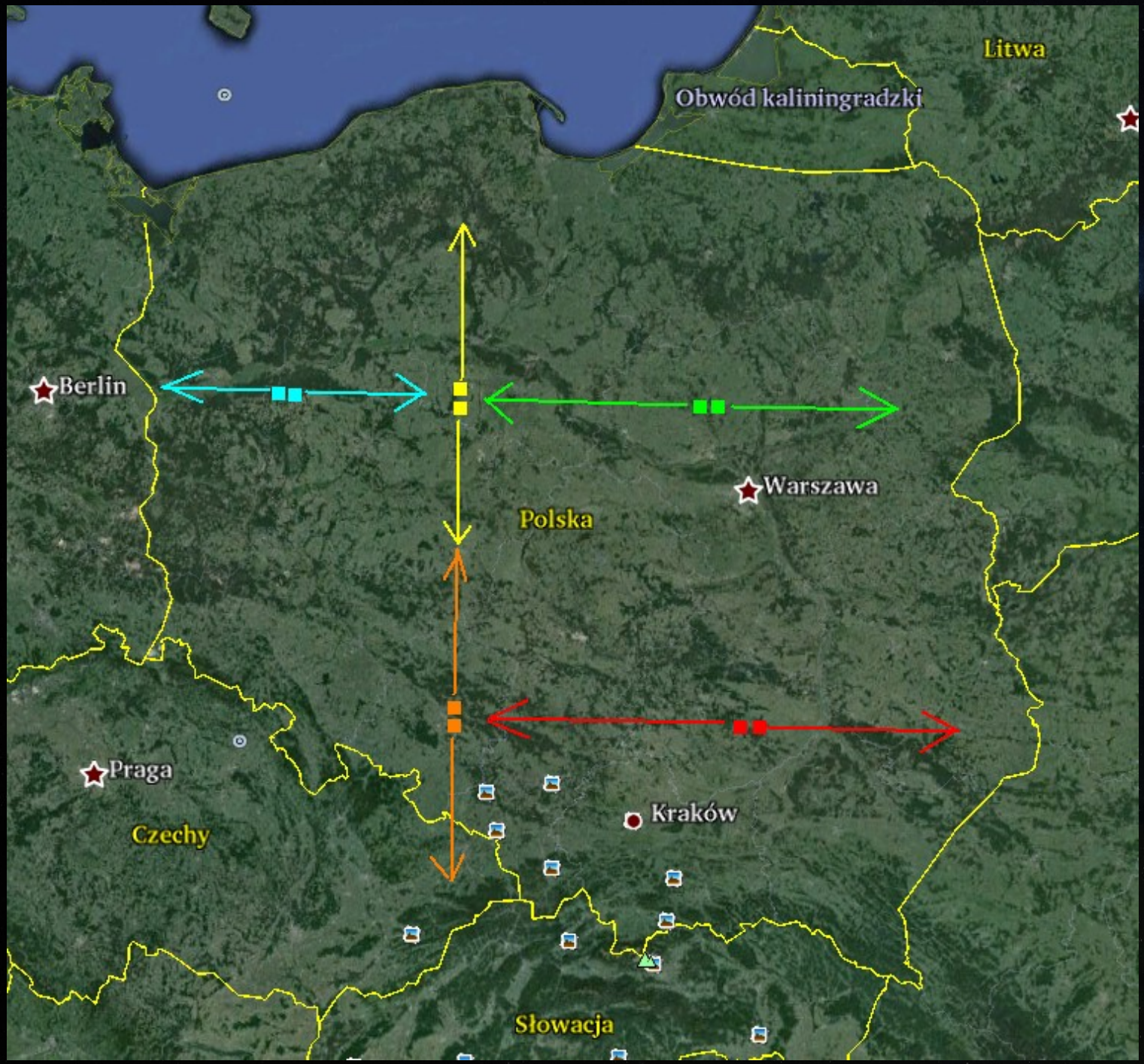
2 x ZWO ASI 120MM with 3-8mm f/1.0 megapixel lens

2 x PC (cheap one)

UFO Capture HD (or something else if UFO will be not sufficient)



AN EXAMPLE OF CAMERA DISLOCATION



SPECTROSCOPIC STATION

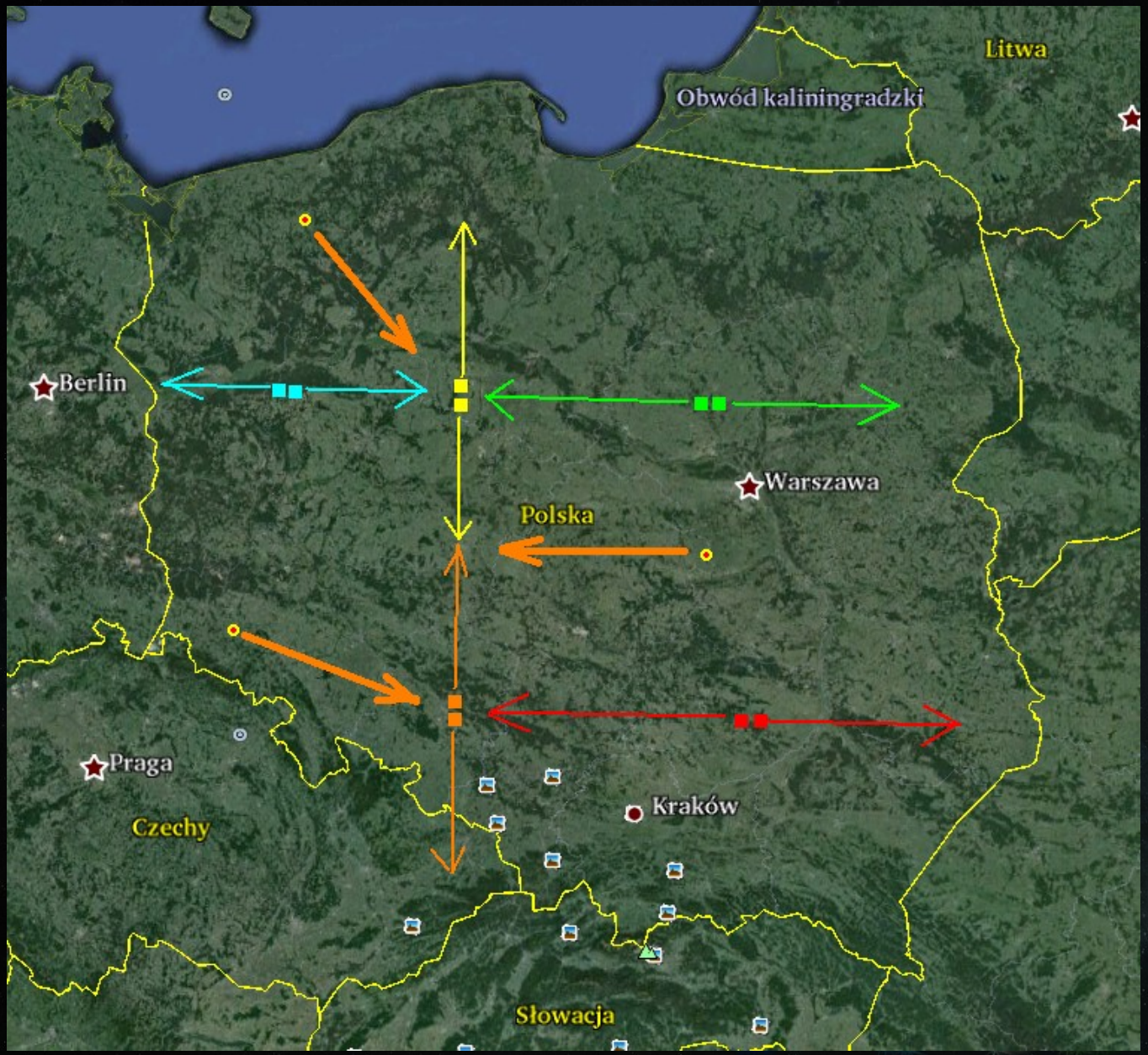
~ 600 EUR

1 x ZWO ASI 120MM with 3-8mm f/1.0 megapixel lens + 1000 lpm diffraction grating

1 x PC (cheap one)

Our own processing software (working in 12-bit depth, still image capturing)

Spectroscopic stations will be directed between two megapixel fireball stations



POSIBLE NUMBER OF STATIONS

Megapixel camera stations (2 cam each):

10 – 12 stations till 2017

Spectroscopic stations:

6 – 8 stations till 2017

OTHER EXPENSES:

Possilble lens upgrades in existing PFN CCTV stations

Raplacement of some CCTV-s to Mintrons 12V6

AND OTHER EXPENSES:

New fast computers for data analysis, data storage devices and data storage devices and data storage devices and data storage.....

Expeditions

Conferences

And so on

ACKNOWLEDGEMENTS

This work was supported by the National Science Center
(decision no. DEC-2013/09/B/ST9/02168)