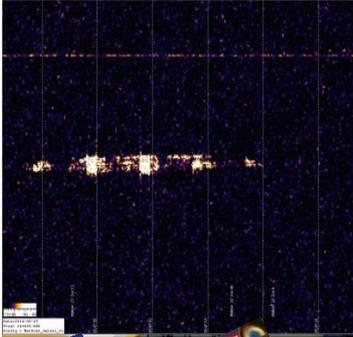




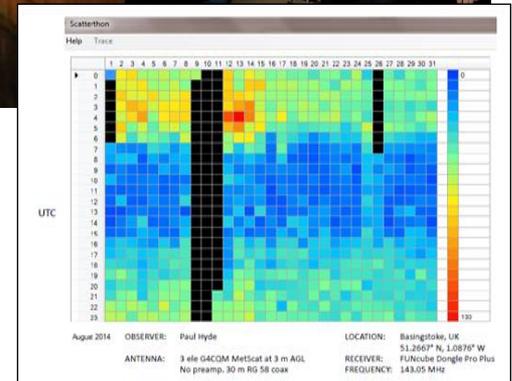
# Practical Meteor Observing

## Scatterthon Software Development



2015

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# Scatterthon

## *What we cover today*



*Today we introduce a useful meteor observing data cleansing tool – Scatterthon...*

- *Scatterthon: Raison d'être*
- *I/O and Installation*
- *Recommended Workflow*
- *Scatterthon Turbocharged*
- *Event Coverage Solutions*
- *Cross-platform Future*





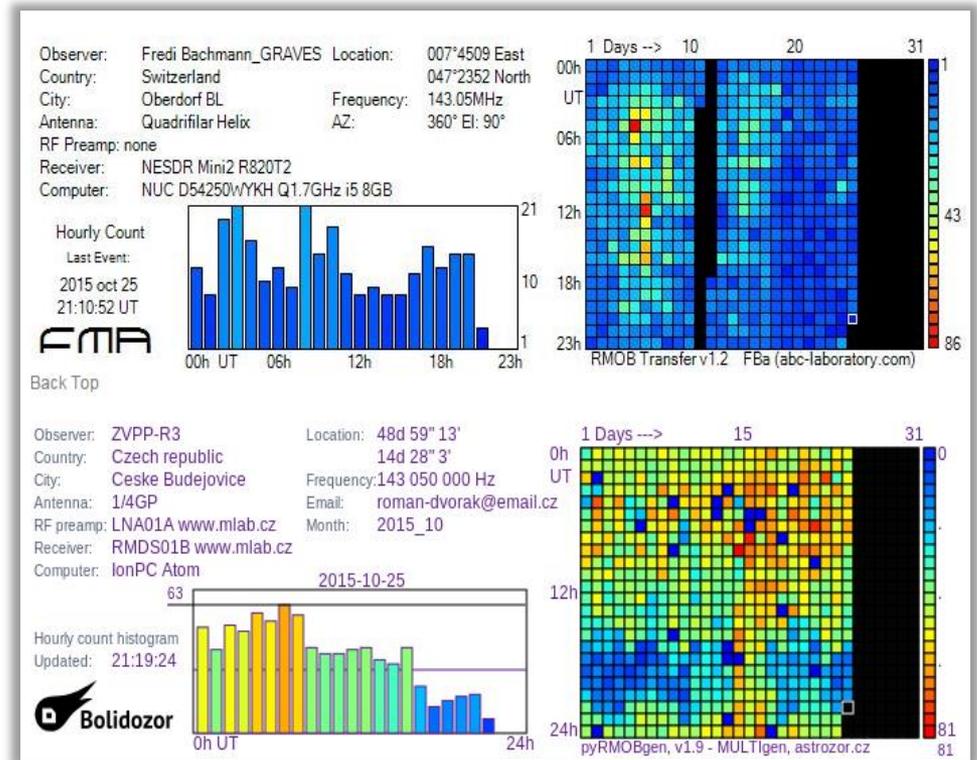
# Scatterthon

## Why is it here...



Scatterthon brings the ability to quickly check, classify and visualise your meteor observing data...

- *Inspiration: RMOB*
- *Believe it when you see it*
- *When speed matters*
- *Visualise your efforts*
- *Compare and contrast*





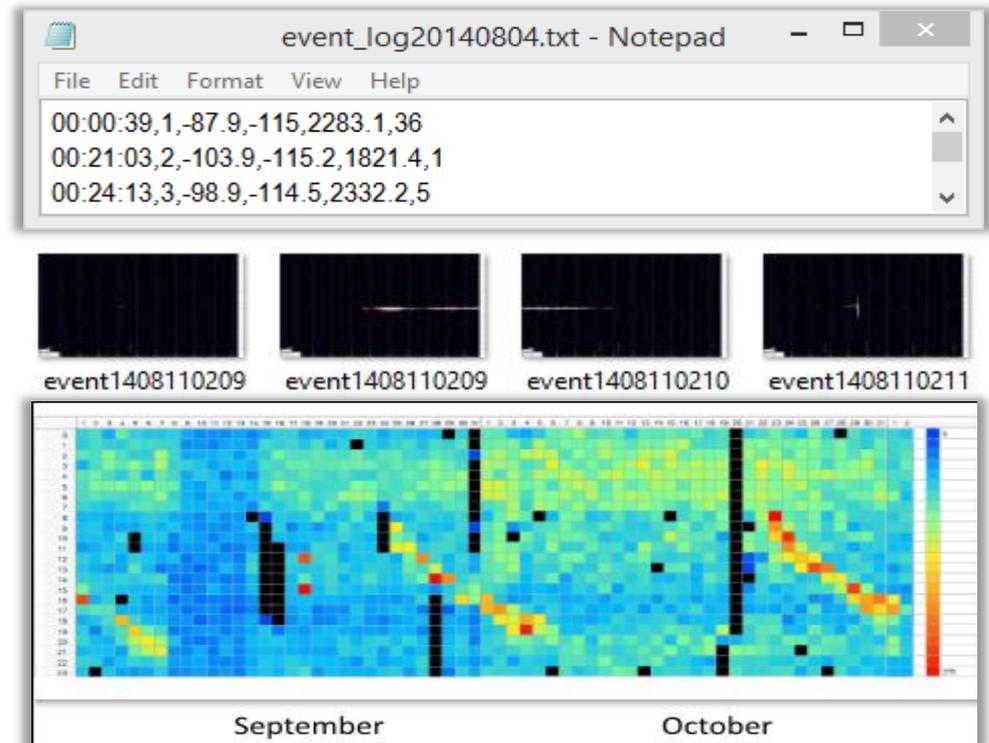
# Scatterthon



## *Inputs, Outputs and Installation*

*From SpectrumLab to RMOB-style visualization, all by virtue of just three files on your Windows OS...*

- *Consists of:*
  - *Scatterthon.exe*
  - *Scatterthon.exe.config*
  - *LogFileViewer.dll*
- *Inputs:*
  - *Logs*
  - *Screenshots*
- *Outputs:*
  - *Files*
  - *Screens*
  - *Stats*





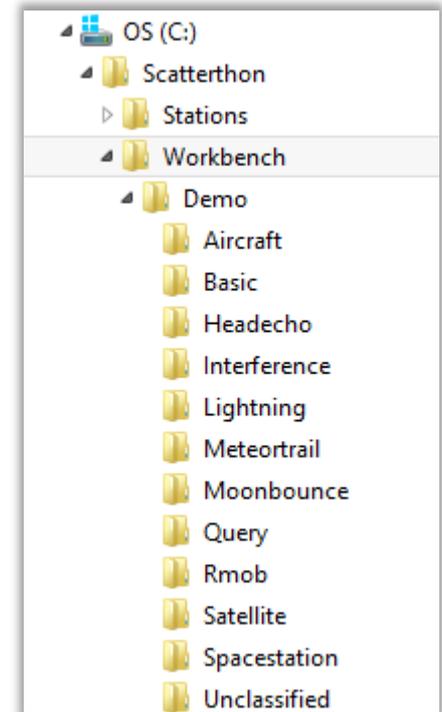
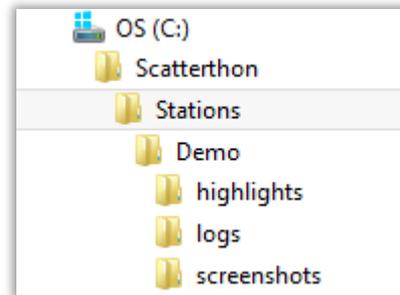
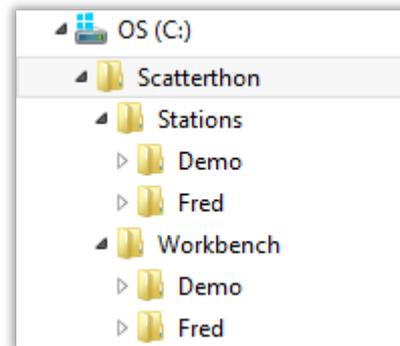
# Scatterthon



## *Inputs, Outputs and Installation*

*The folder structure is highly nested in order to accommodate multiple stations and types of outputs...*

- *C:\Scatterthon*
  - *Stations*
  - *Workbench*
- **“Stations”** contains:
  - *Inputs by station name*
- **“Workbench”** contains:
  - *Outputs by station name*
  - *Scatterthon software*





# Scatterthon



## *Recommended Workflow*

*Copy files > Configure > Calibrate > Capture "Before" > Split/Merge/Classify > Normalize > Enjoy results!*

- *Copy Files*
- *Configure*
- *Calibrate*
- *Capture "Before"*
- *Split/Merge/Classify*
- *Normalize*
- *Enjoy the results!*





# Scatterthon

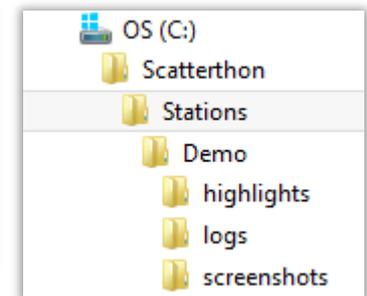
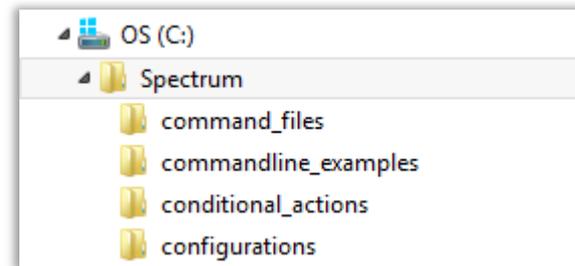
## Recommended Workflow



**Copy files** > *Configure* > *Calibrate* > *Capture "Before"* > *Split/Merge/Classify* > *Normalize* > *Enjoy results!*

### Copy Files from...

- *C:\Spectrum*
  - *Log files*
- *C:\Spectrum\Screenshots*
  - *Screenshots*



### To your chosen station...

- *C:\Scatterthon\Stations*
  - *\Demo\logs*
  - *\Demo\screenshots*





# Scatterthon



## Recommended Workflow

Copy files > **Configure** > Calibrate > Capture "Before" > Split/Merge/Classify > Normalize > Enjoy results!

1. Create new Station
  2. Specify where to...
    - Find log files
    - Find screenshots
    - Store highlights
  3. Click "Save"
  4. Click "Reload"
- Offset Duration next...

The screenshot shows the configuration window for a Scatterthon station. The interface includes a vertical toolbar on the right with buttons for 'Cleanse', 'Preview', 'RMOB', and 'Config'. The main configuration area contains the following fields and options:

- Station Name:** A 'New...' button, a dropdown menu set to 'Demo', and a checked checkbox for 'Save as default station'.
- Original log files directory:** A text box containing 'C:\Scatterthon\Stations\Demo\logs'.
- Original screenshots directory:** A text box containing 'C:\Scatterthon\Stations\Demo\screenshots'.
- Highlights directory:** A text box containing 'C:\Scatterthon\Stations\Demo\highlights'.
- Review Screenshot Duration (secs):** A text box containing '300' and an unchecked checkbox for 'Use Pagination'.
- Offset Duration:** A text box containing '40'.
- Annual top meteor count:** A text box containing '24', an 'Apply' button, and a checked checkbox for 'Ignore annual top meteor count setting'.
- Display Options:** Three unchecked checkboxes: 'Show Signal Column', 'Show Noise Column', and 'Show Freq Column'.



# Scatterthon

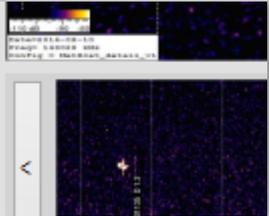


## Recommended Workflow

Copy files > Configure > **Calibrate** > Capture "Before" > Split/Merge/Classify > Normalize > Enjoy results!

- *Offset Duration*
- *Helps synchronise:*
  - *Timestamp in log files*
  - *Event stamp in images*
  - *Timestamp on image files*

15:24:51	12	1	
15:32:02	13	111	
▶ 15:32:30	14	2	
15:32:56	15	1	
15:32:59	16	3	



Copy event\_log20140810 [1 of 186].. **event140810153232**

Generate RMOB  Drop History

1. *Sort by Duration (Desc)*
2. *Spot blanks > 3*
3. *Config and "Reload"*
4. *Very satisfying!*





# Scatterthon



## Recommended Workflow

Copy files > Configure > Calibrate > **Capture "Before"** > Split/Merge/Classify > Normalize > Enjoy results!

1. Go to "Cleanse" tab
  2. Click "Next" until end
  3. Click "RMOB" tab
  4. Uncleansed view ready
- **Tip: Export for reference!**

The screenshot shows the Scatterthon software interface. On the left, there is a table with columns for Time, Event, Duration, and Class. The table contains 24 rows of data. The right side of the interface shows a sky plot with a vertical strip of data. Below the sky plot, there are three smaller plots showing different views of the data. The interface includes a 'Help' menu, a 'Cleanse' tab, and a 'Preview' button. The bottom of the interface has a 'Merge' field set to 0, a 'Split' button, an 'Undo' button, and an 'Apply' button. There are also checkboxes for 'Generate RMOB' and 'Drop History', and a 'Go' button.

Time	Event	Duration	Class
00:00:48	1	3	
00:01:21	2	3	
00:04:09	3	1	
00:04:28	4	2	
00:05:31	5	5	
00:05:35	6	283	
00:06:43	7	2	
00:06:59	8	2	
00:07:32	9	11	
00:08:21	10	9	
00:09:15	11	3	
00:09:28	12	1	
00:14:25	13	5	
00:14:34	14	3	
00:16:39	15	1	
00:17:07	16	1	
00:17:25	17	2	
00:18:55	18	2	
00:23:59	19	2	
00:28:14	20	2	
00:28:26	21	1	
00:29:17	22	1	
00:30:13	23	2	
00:31:28	24	69	



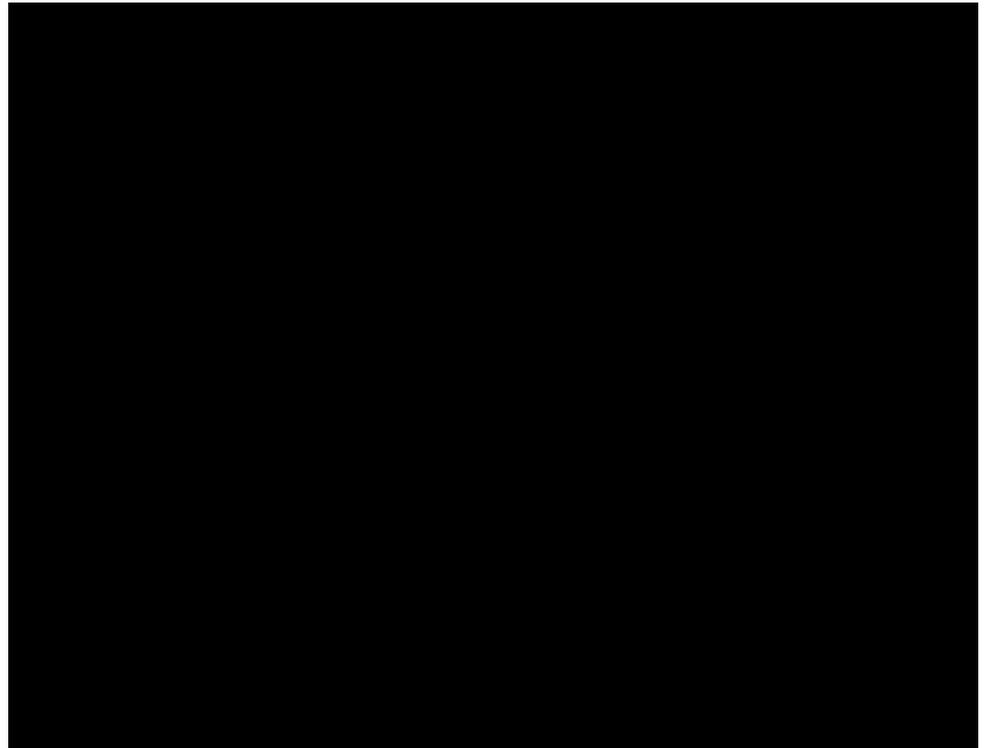
# Scatterthon

## *Recommended Workflow*



*Copy files > Configure > Calibrate > Capture “Before” > **Split**/Merge/Classify > Normalize > Enjoy results!*

- *Split event log entry*
  1. *Select row to split*
  2. *Enter number of events*
  3. *Click “Split”*





# Scatterthon



## Recommended Workflow

Copy files > Configure > Calibrate > Capture “Before” > Split/**Merge**/Classify > Normalize > Enjoy results!

- Merge several log entries

1. Select rows to merge
2. Click “Merge”

The screenshot shows the Scatterthon software interface. On the left, a table displays event logs with columns for Time, Event, Duration, and Class. The row for event 99 is selected. On the right, a spectrogram shows the frequency spectrum of the selected event. The interface includes a 'Merge' button and a 'Generate RMOB' checkbox.

Time	Event	Duration	Class
05:49:53	86	4	
05:49:59	87	4	
05:50:09	88	4	
05:50:32	90	4	
05:50:32	89	1	
05:50:37	91	4	
05:51:57	92	4	
05:52:16	93	21	
05:52:55	94	4	
05:53:10	95	1	
05:53:21	96	3	
05:54:42	97	3	
05:55:26	98	3	
05:55:34	99	5	
05:56:05	100	137	
05:56:27	101	10	
05:56:38	102	4	
05:57:23	103	1	
05:57:24	104	2	
05:57:35	105	6	
05:58:31	106	2	
05:59:04	107	1	
06:00:09	1	2	
06:01:26	?	4	



# Scatterthon

## Recommended Workflow



*Copy files > Configure > Calibrate > Capture “Before” > Split/Merge/Classify > Normalize > Enjoy results!*

- *Classify event types*
  - *Mark events as “removed”*
1. *Select rows to classify*
  2. *Select classification*
  3. *Click “Apply”*

The screenshot shows the Scatterthon software interface. On the left, a table displays event data with columns for Time, Event, Duration, and Class. The event at 05:51:57 is selected. Below the table are controls for Merge, Split, Undo, and Apply. On the right, a large image shows a star field with a bright event highlighted. Below the image are navigation controls and checkboxes for 'Generate RMOB' and 'Drop History'.

Time	Event	Duration	Class
05:39:03	70	1	
05:40:01	71	3	
05:40:43	72	2	
05:41:33	73	29	
05:43:54	74	2	
05:44:06	75	34	
05:44:40	76	1	
05:45:16	77	5	
05:45:33	78	1	
05:45:41	79	1	
05:47:45	80	4	
05:48:09	81	3	
05:48:58	82	3	
05:49:19	83	15	
05:49:27	84	2	
05:49:30	85	71	
05:49:53	86	4	
05:49:59	87	4	
05:50:09	88	4	
05:50:32	90	4	
05:50:32	89	1	
05:50:37	91	4	
05:51:57	92	4	
06:52:16	93	71	



# Scatterthon

## Recommended Workflow



Copy files > Configure > Calibrate > Capture “Before” > Split/Merge/Classify > **Normalize** > Enjoy results!

- *Normalize across months...*

1. *Untick “Ignore annual...”*
2. *Enter highest count*
3. *Click “Apply”*
  - *Apply that for each month retrospectively, if necessary...*
  - *Rolling highest count is applied automatically*

The screenshot shows the configuration window for the 'Normalize' step in the Scatterthon software. The window has a sidebar on the right with buttons for 'Cleanse', 'Preview', 'FMQB', and 'Config'. The main area contains several fields and checkboxes:

- Station Name: New... Demo  Save as default station
- Original log files directory: C:\Scatterthon\Stations\Demo\logs
- Original screenshots directory: C:\Scatterthon\Stations\Demo\screenshots
- Highlights directory: C:\Scatterthon\Stations\Demo\highlights
- Review Screenshot Duration (secs): 300  Use Pagination
- Offset Duration: 40
- Annual top meteor count: 24   Ignore annual top meteor count setting
- Show Signal Column
- Show Noise Column
- Show Freq Column

The 'Annual top meteor count' field, the 'Apply' button, and the 'Ignore annual top meteor count setting' checkbox are highlighted with a red box.



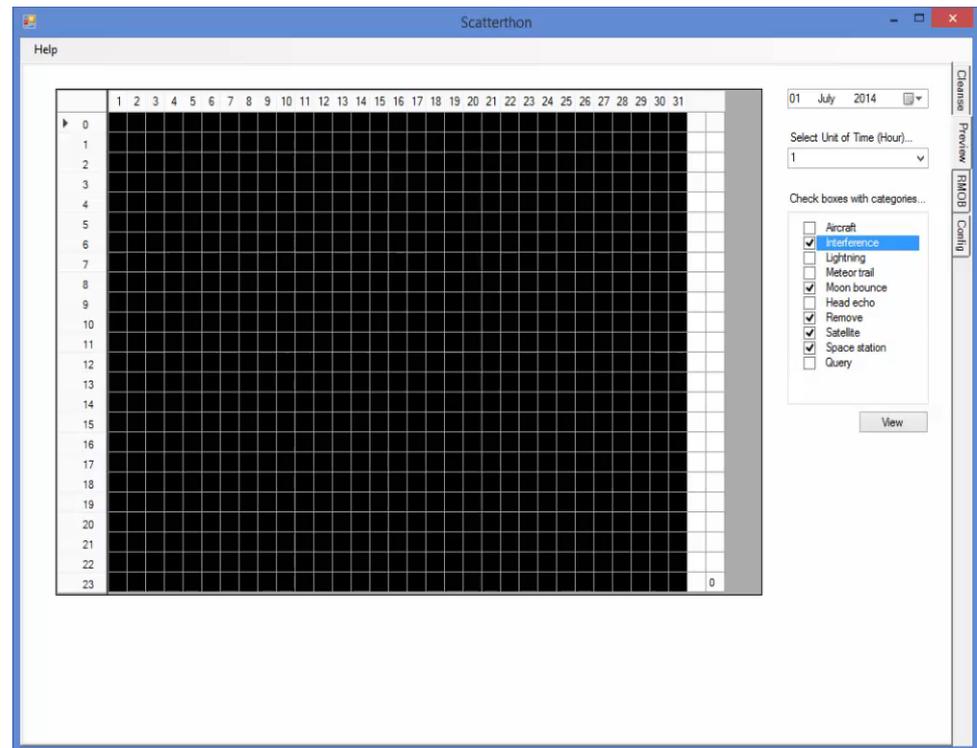
# Scatterthon

## Recommended Workflow



*Copy files > Configure > Calibrate > Capture "Before" > Split/Merge/Classify > Normalize > **Enjoy results!***

- *View Classifications*
  - *By Month*
  - *By Category*
  - *By Unit of Time*
- *Demo*
  - *Month and Unit of Time*





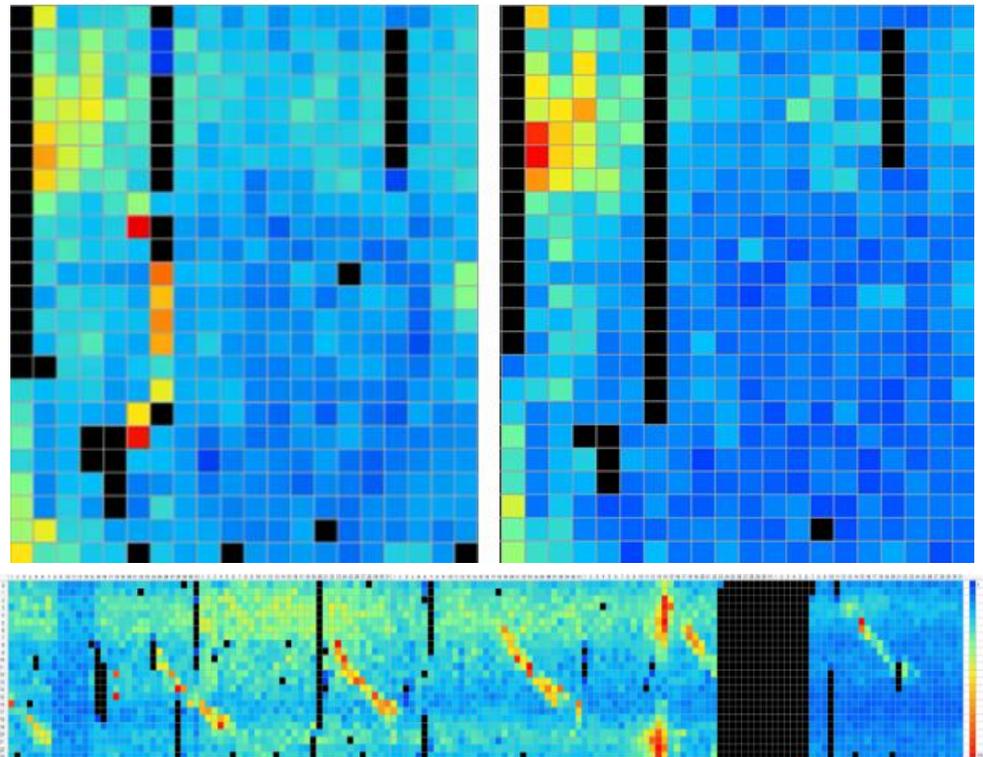
# Scatterthon

## Recommended Workflow



*Copy files > Configure > Calibrate > Capture "Before" > Split/Merge/Classify > Normalize > **Enjoy results!***

- *View RMOB*
  - *Import*
  - *Export*
  - *Concatenate*





# Scatterthon



## Scatterthon Turbocharged

Productivity improvements with keyboard shortcuts for splitting, merging and classification operations

- *Splitting Shortcuts*
- *Ctrl, Number + Enter*

The screenshot displays the Scatterthon application window. On the left, a table lists event data with columns for Time, Event, Duration, and Class. The event at 00:46:16 is selected. On the right, a spectrogram shows a signal over time, with a zoomed-in view of the selected event below it. The interface includes a 'Merge' control set to 0, an 'Undo' button, and checkboxes for 'Generate RIMOB' and 'Drop History'.

Time	Event	Duration	Class
00:37:31	30	2	
00:41:10	31	1	
00:42:17	32	3	
00:46:04	33	5	
00:46:11	34	2	
00:46:16	35	1	
00:46:54	36	13	
00:48:12	37	2	
00:49:00	38	1	
00:50:40	39	4	
00:51:43	40	3	
00:52:32	41	1	
00:54:35	42	2	
00:56:07	43	1	
00:57:14	44	2	
01:02:15	1	6	
01:04:02	2	1	
01:05:46	3	1	
01:05:57	4	2	
01:06:58	5	4	
01:12:10	6	1	
01:13:45	7	3	
01:14:31	8	4	
01:16:22	9	24	



# Scatterthon



## Scatterthon Turbocharged

Productivity improvements with keyboard shortcuts for splitting, merging and classification operations

- *Merging Shortcuts*
- *Shift + Enter*

The screenshot displays the Scatterthon software interface. On the left, a 'Help' window is open, showing a table of event data. The table has columns for Time, Event, Duration, and Class. The event at 05:55:28 is highlighted. Below the table are controls for Merge (set to 0), Split, Undo, and Apply. On the right, the main window shows a spectrogram of the event. The spectrogram is a dark image with vertical lines and a horizontal band of activity. Below the spectrogram are navigation controls, including a 'Copy' button, a file path 'event\_log20140812 [3 of 186]... event14081205557', and checkboxes for 'Generate RMOB' and 'Drop History'. A 'Go' button is also present.

Time	Event	Duration	Class
05:50:37	91	4	
05:51:57	92	4	
05:52:16	93	21	
05:52:55	94	4	
05:53:10	95	1	
05:53:21	96	3	
05:54:42	97	3	
05:55:28	98	3	
05:55:34	99	5	
05:56:05	100	137	
05:56:27	101	10	
05:56:38	102	4	
05:57:23	103	1	
05:57:24	104	2	
05:57:35	105	6	
05:58:31	106	2	
05:59:04	107	1	
06:00:09	1	2	
06:01:26	2	4	
06:02:13	3	65	
06:02:30	4	2	
06:05:16	5	4	
06:06:56	6	1	
06:07:40	7	?	



# Scatterthon

## Scatterthon Turbocharged



Productivity improvements with keyboard shortcuts for splitting, merging and classification operations

- *Classification Shortcuts*
- *Alt, Number + Enter, Enter*

The screenshot displays the Scatterthon software interface. On the left, a table lists event data with columns for Time, Event, Duration, and Class. The event at 05:49:30 is highlighted. On the right, a spectrogram shows a signal with a crosshair. Below the spectrogram are controls for merging, splitting, and generating RMOB files.

Time	Event	Duration	Class
05:38:37	69	1	
05:39:03	70	1	
05:40:01	71	3	
05:40:43	72	2	
05:41:33	73	29	
05:43:54	74	2	
05:44:06	75	34	
05:44:40	76	1	
05:45:16	77	5	
05:45:33	78	1	
05:45:41	79	1	
05:47:45	80	4	
05:48:09	81	3	
05:48:58	82	3	
05:49:19	83	15	
05:49:27	84	2	
05:49:30	85	71	
05:49:53	86	4	
05:49:59	87	4	
05:50:09	88	4	
05:50:32	90	4	
05:50:32	89	1	
05:50:37	91	4	
06:51:47	92	4	



# Scatterthon

## Event Coverage Solutions



*The data we cannot see is the data we cannot classify. We need continuous visual capture.*

- 5-minute screen captures
- Pop-out Images
- Pagination

The screenshot displays the Scatterthon software interface. On the left, a table lists event data:

Time	Event	Duration	Class
00:02:16	1	0.500	
00:07:31	2	0.500	
00:07:57	3	0.249	
00:09:07	4	0.500	
00:14:17	5	1.000	
00:15:15	6	0.500	
00:15:27	7	1.000	
00:16:10	8	0.500	
00:27:24	9	0.500	
00:28:33	10	0.251	
00:29:51	11	1.751	
00:31:50	12	0.500	
00:38:58	13	0.500	
00:42:51	14	0.500	
00:42:57	15	1.250	
00:43:19	16	0.250	
00:53:19	17	0.250	
00:53:58	18	0.750	
00:54:02	19	0.500	
00:54:06	20	1.000	
00:54:33	21	0.249	
00:56:53	22	0.250	
01:01:53	1	0.251	
01:02:50	2	0.751	

On the right, a spectrogram visualization shows frequency (4000 Hz to 4800 Hz) over time. The spectrogram displays vertical lines of activity corresponding to the events listed in the table. Below the spectrogram, there are three pop-out image thumbnails. At the bottom, there are controls for Merge (0), Split, Undo, Apply, Copy, and pagination (event\_log20150816 [1 of 1]... event150816000347). There are also checkboxes for Generate RIMOB and Drop History.



# Scatterthon

## *Cross-platform Future?*



*We plan to make Scatterthon open source, available on GitHub for future multiplatform development*

- *Open source on GitHub*
- *MONO*
- *Browser based*
- *ASP.NET 5*





# Scatterthon

## *Any Questions?*



*If you have any questions, now is the time to ask...*

- *Contact Details*
  - 07415 094 820
  - [info@radioastro.org.uk](mailto:info@radioastro.org.uk)



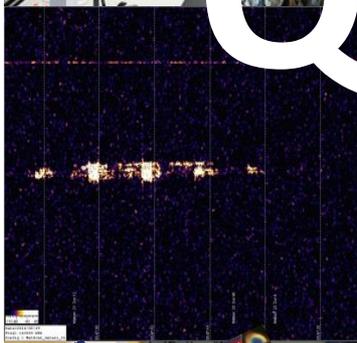


# Practical Meteor Observing

Scatterthon Software Development



# Questions?



2015

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