

Exploring the universe of sleep

Danielle Roberts, Awareness Lab

Artist

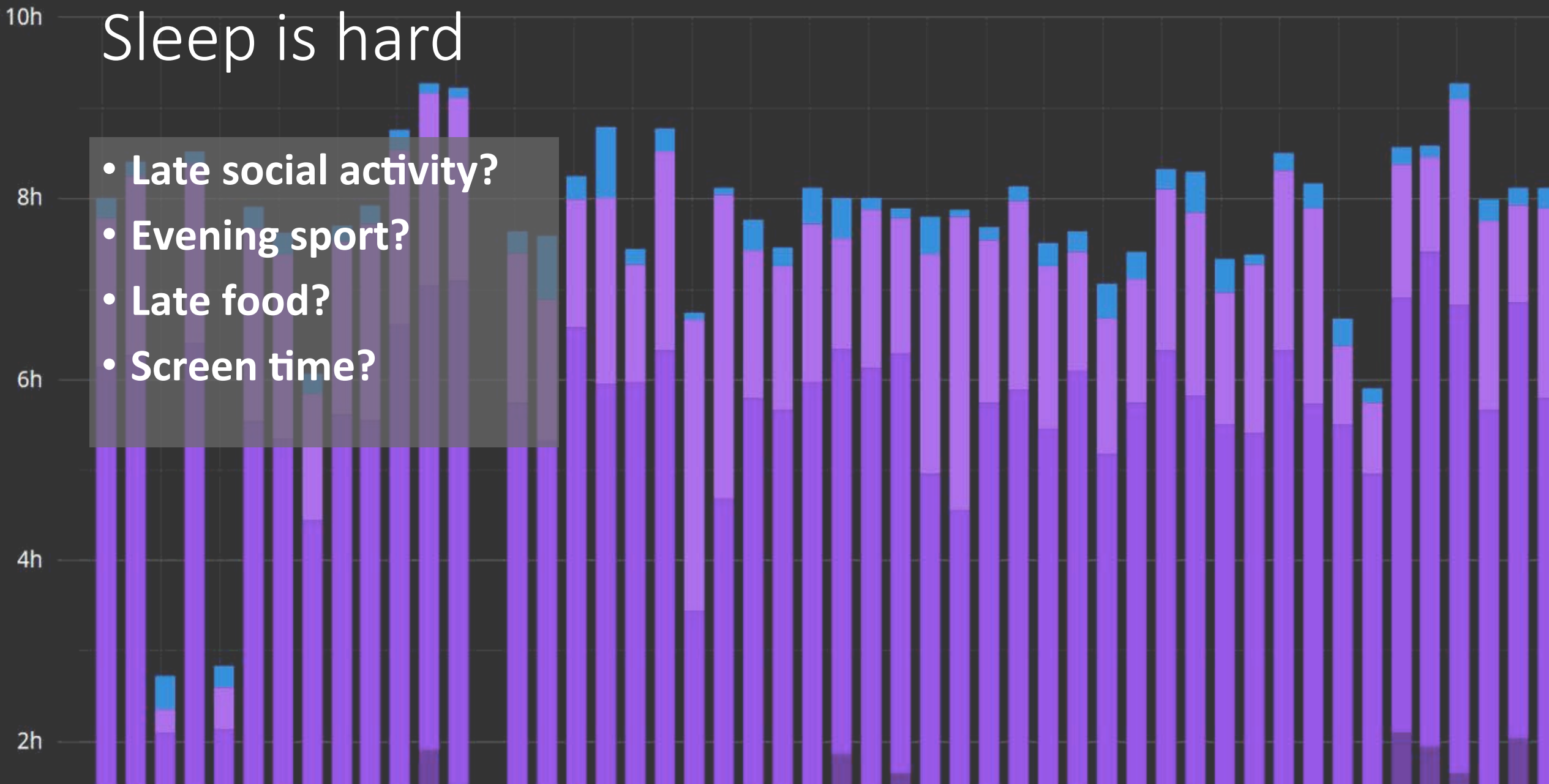
- Reversed calendar



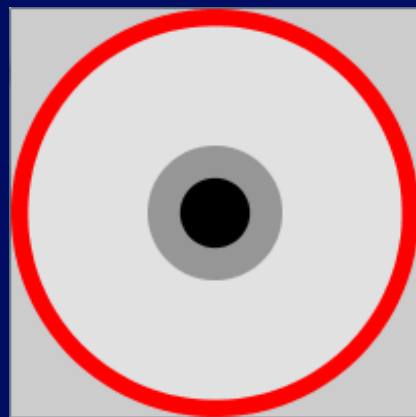
Awake REM Light Deep

Sleep is hard

- Late social activity?
- Evening sport?
- Late food?
- Screen time?



Aim



What I tracked about my sleep

- Time in bed
- Time sleeping
- Time awake
- Deep sleep
- REM sleep
- Light sleep
- HRV evening
- HRV morning
- Sleep rating



What I tracked about my behavior

- sport start- end
- meeting start - end
 - perception of meeting
- calorie intake
- stress level during the day
- happiness level during the day
- screen time duration

How I tracked my behavior

QUESTIONS RESPONSES 7

Start time sport

Time

End time sport

Time

Start time social meeting

Time

End time social meeting

Time

Feeling social meeting

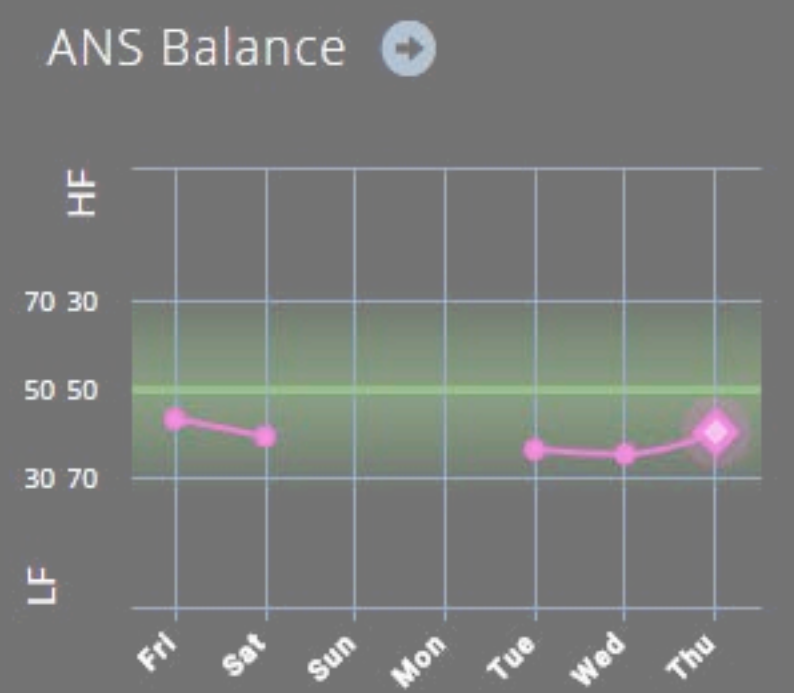
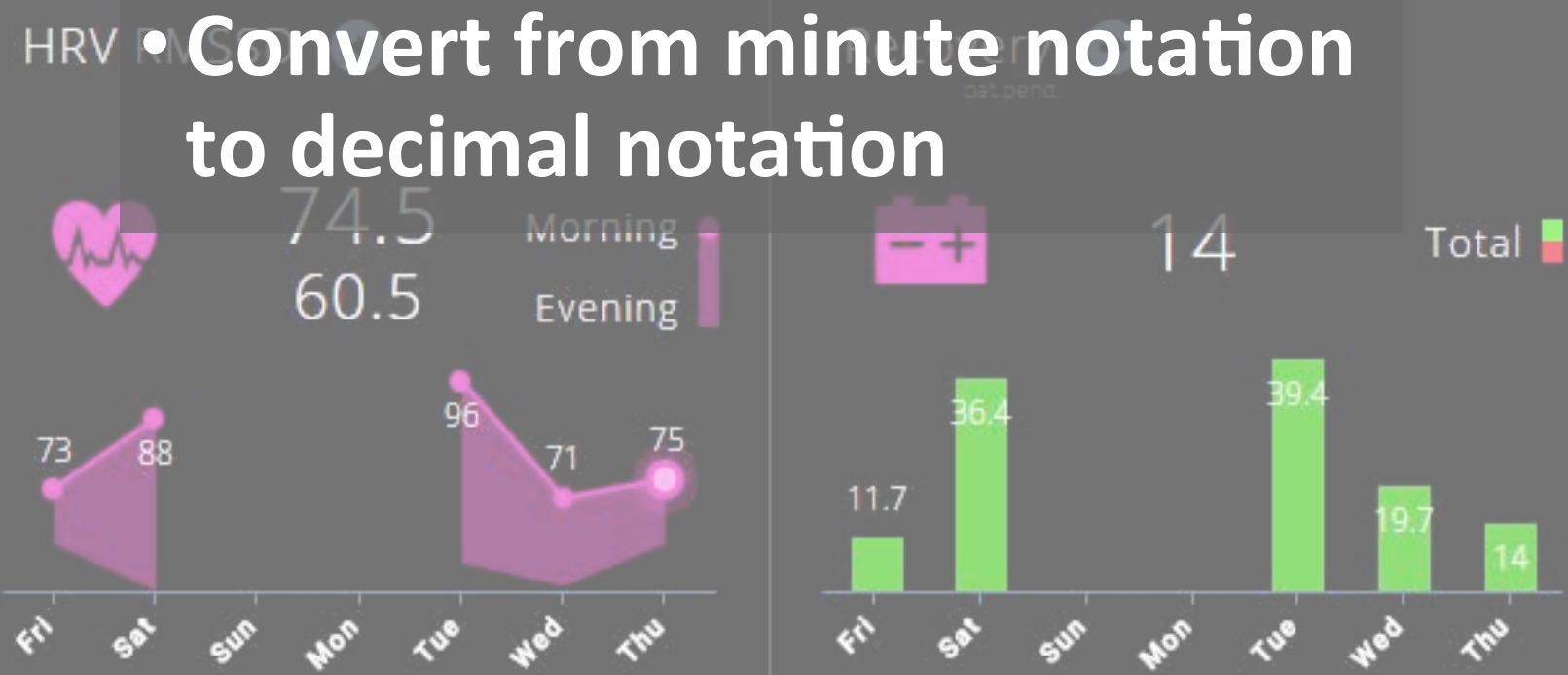
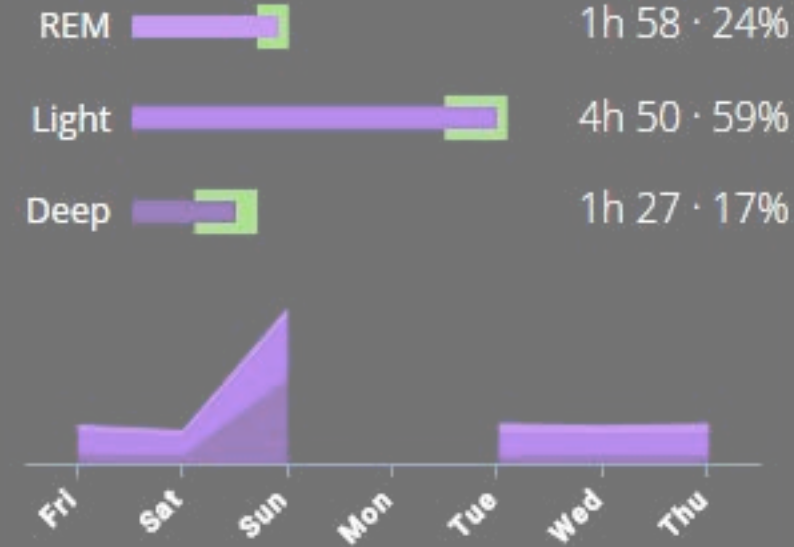
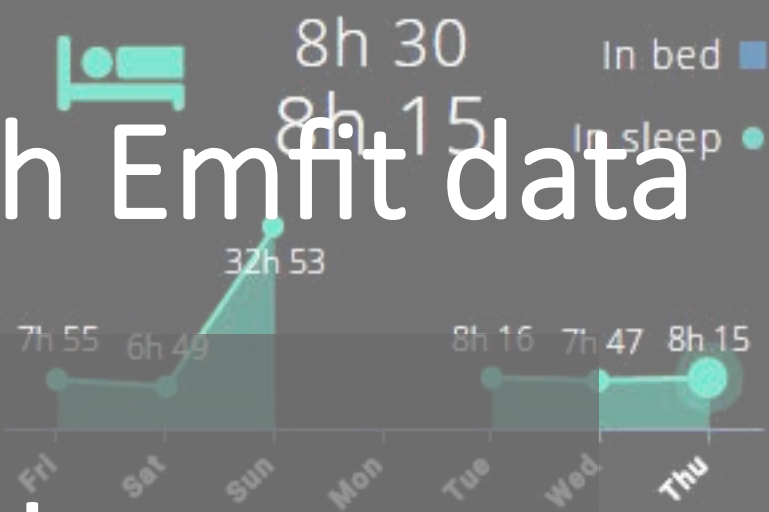
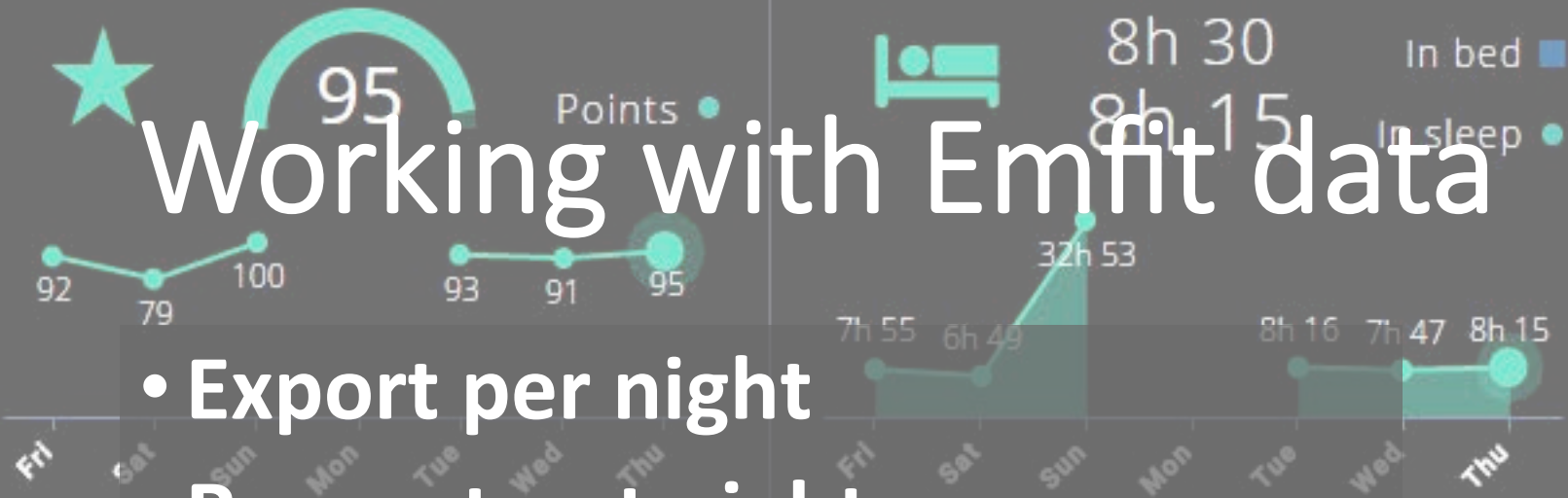
Positive

Neutral

Negative

Working with Emfit data

- Export per night
- Reconstruct night
- Convert from minute notation to decimal notation



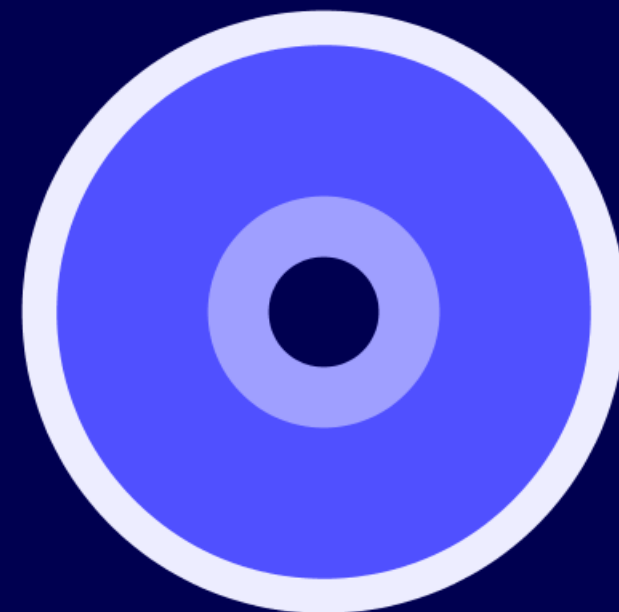
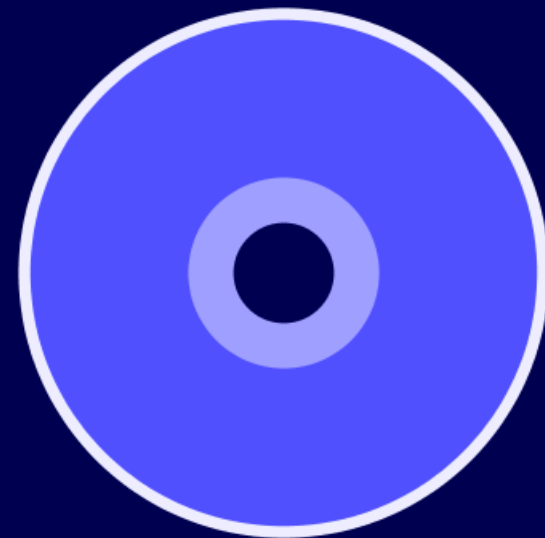


Design



© Reuters

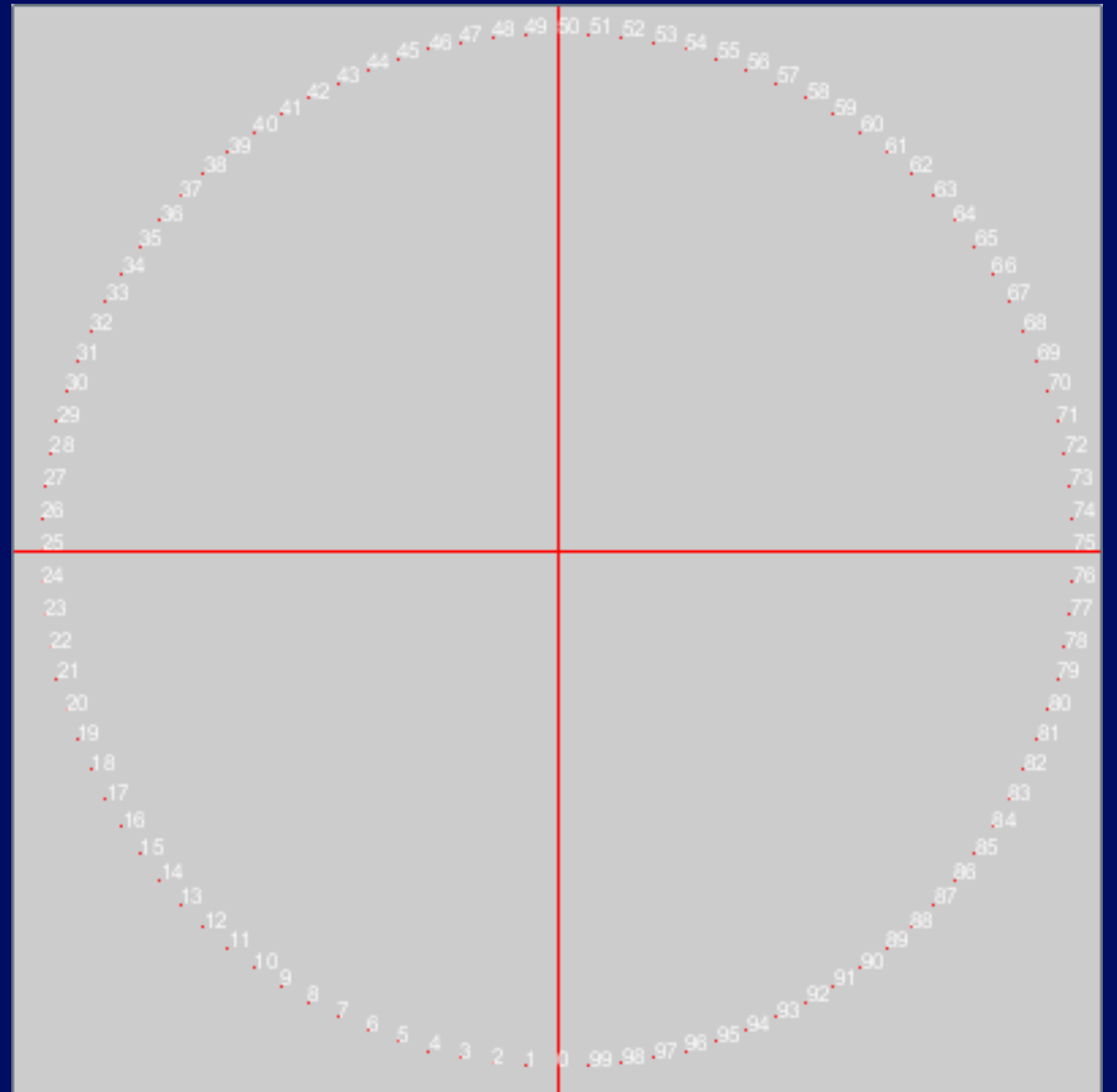
Nights as planets



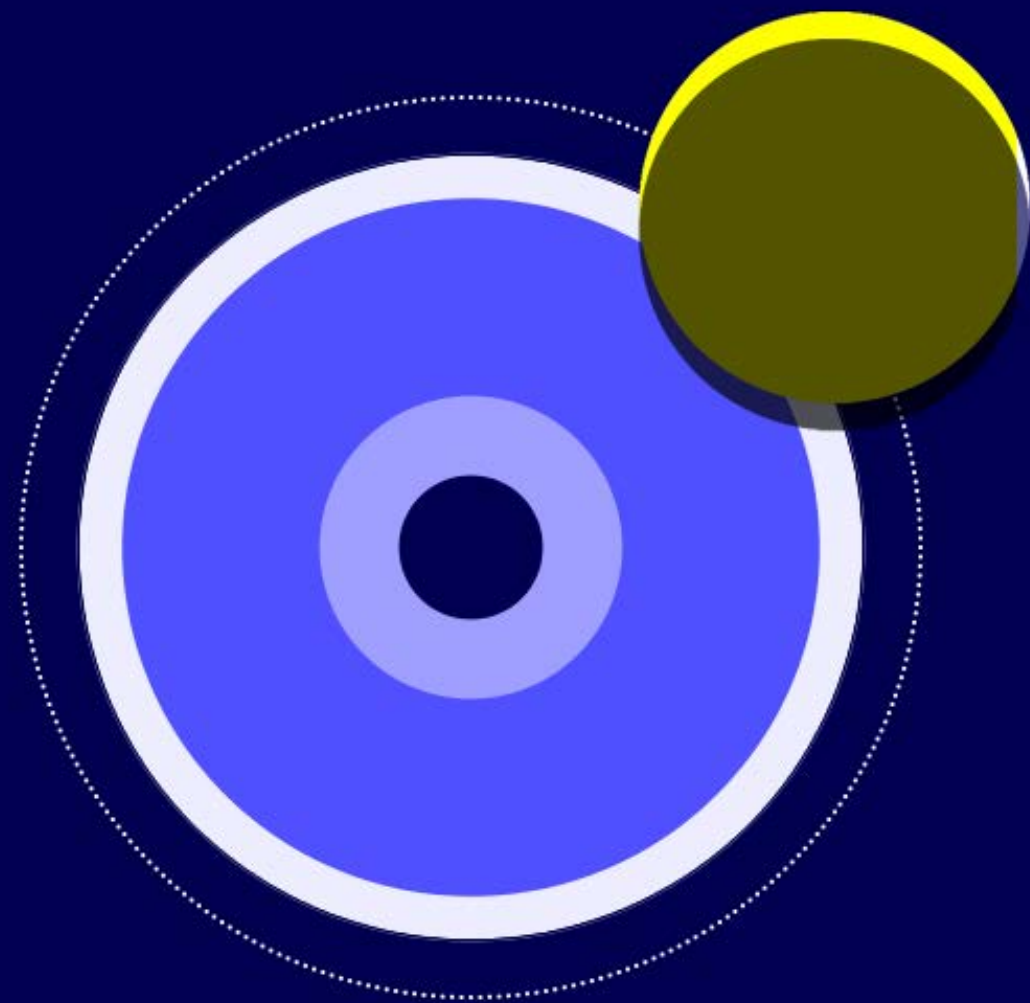
Visualizing variables

- Calories
- Stress & mood
- Recovery
- Evening activities
- Ratings

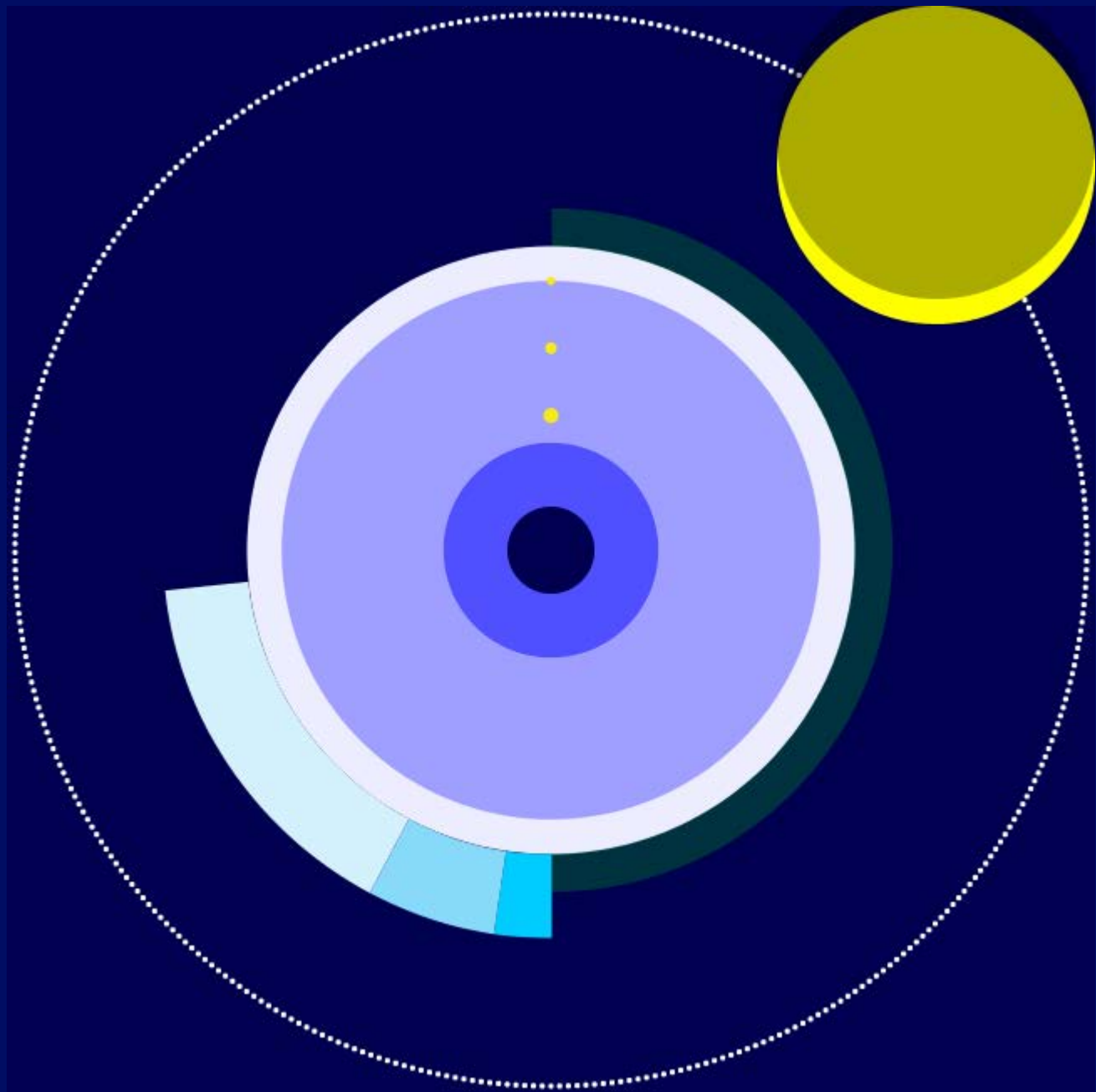
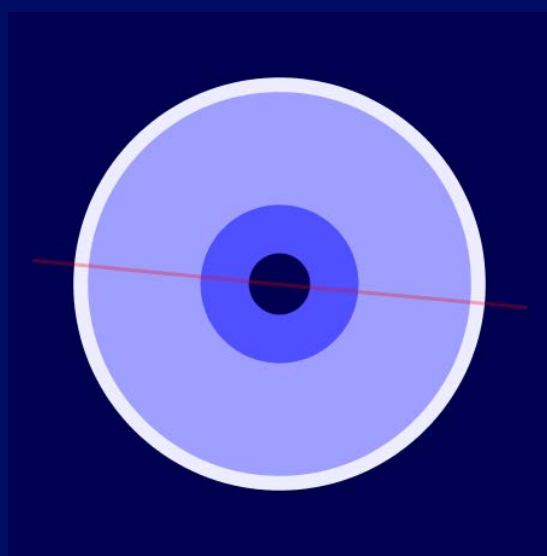
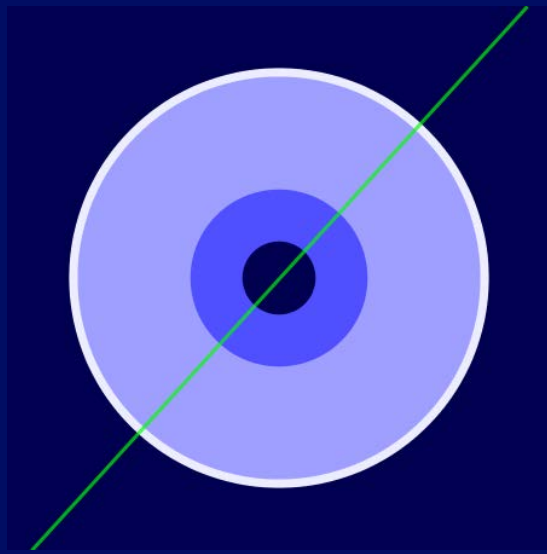
Calories



Stress & mood



Recovery



Evening activities



1hour.png



6hours.png

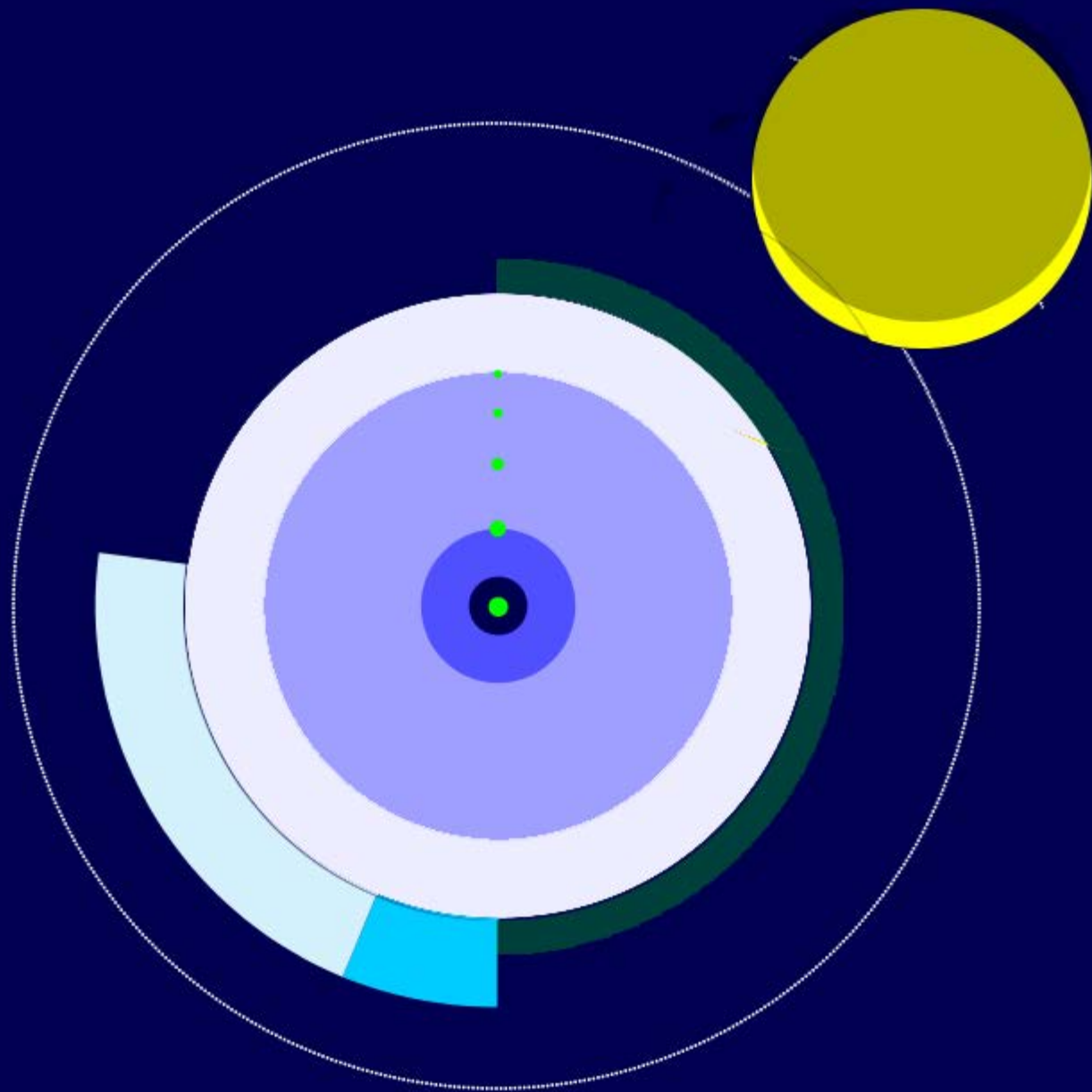
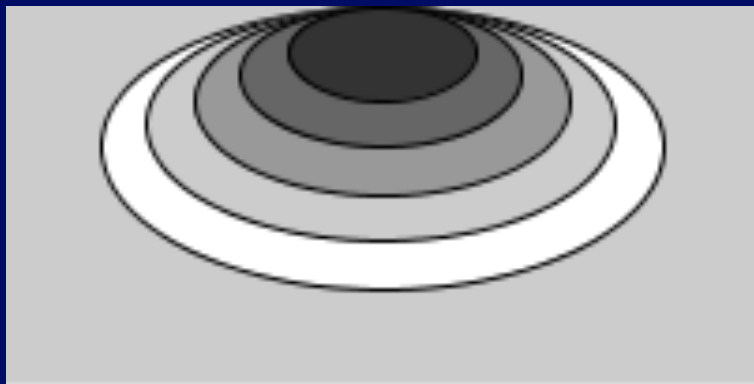


activities.png

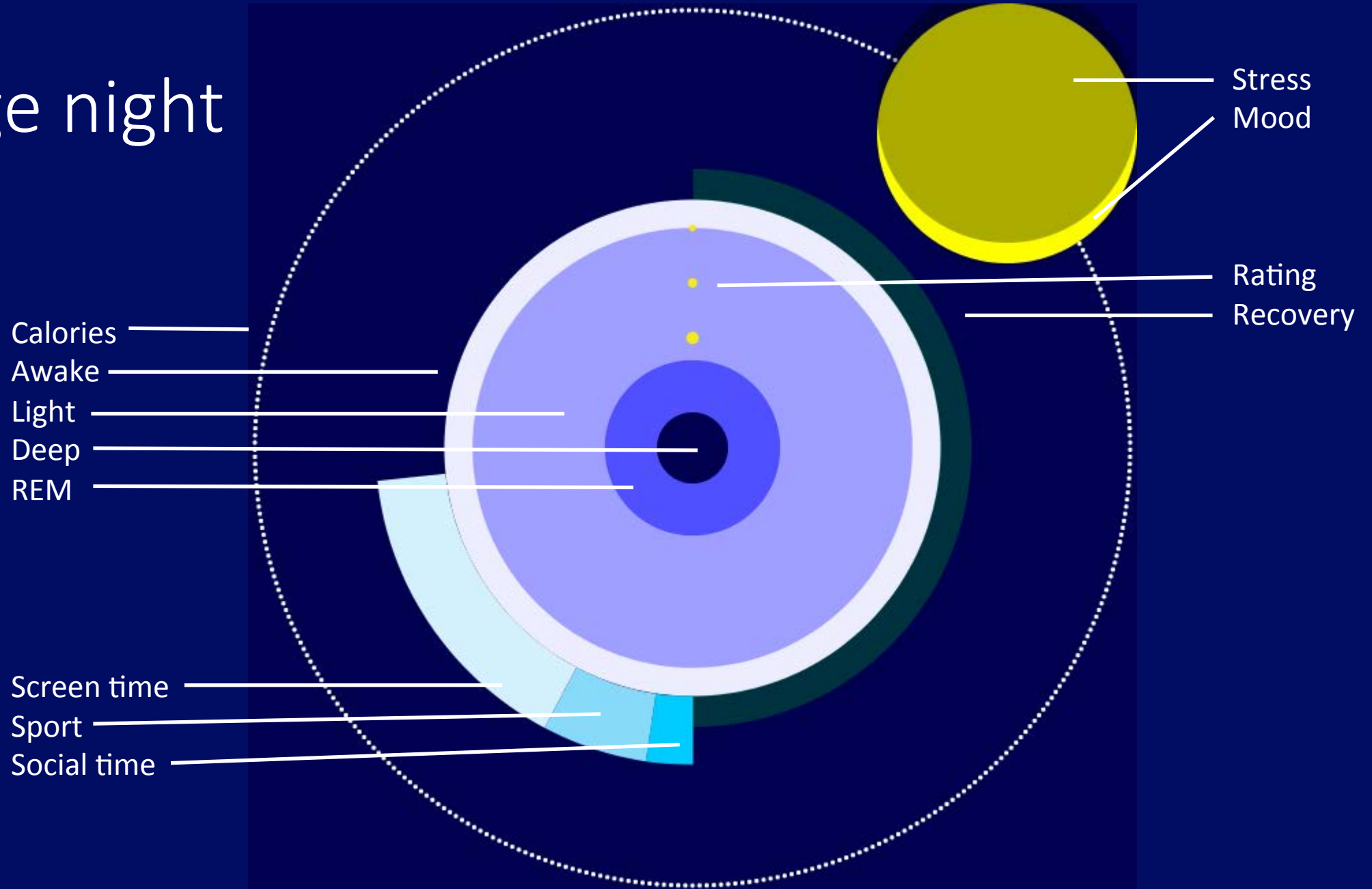


activitiesAndSleep.png

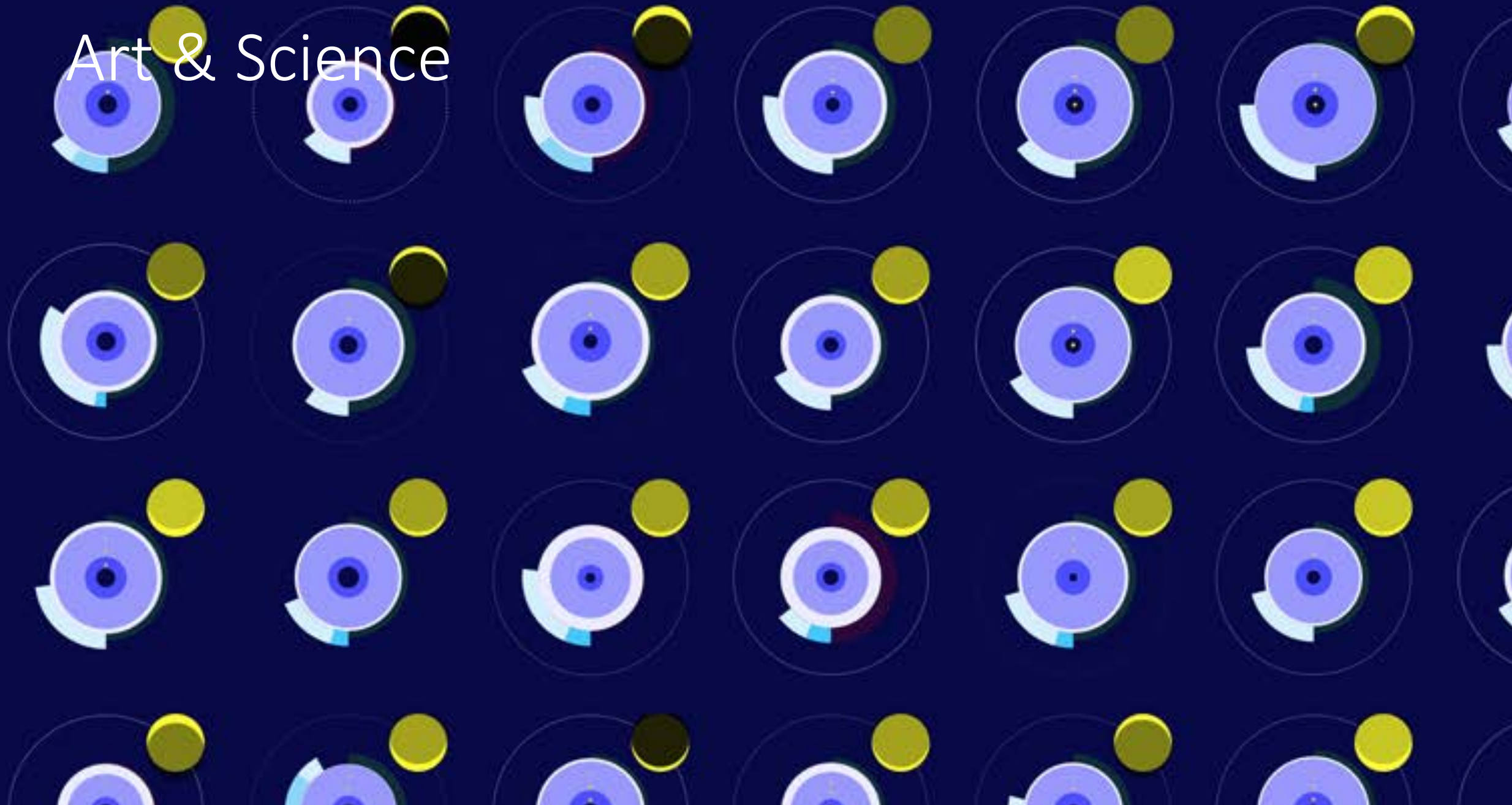
Sleep ratings



Average night



Art & Science



Correlations

Variable 1	Variable 2	Correlation	Explanation
Awake	Morning HRV	-,493**	Not sleeping is bad for HRV
	Systole blood pressure	,396*	Not sleeping raises systole <u>bp</u> the following morning
	REM, light sleep	negative	No correlation found with deep sleep
REM sleep	Morning systole blood pressure	-,378*	REM sleep lowers systole <u>bp</u>
	In sleep, light sleep	Positive**	No correlation found with deep sleep
	Subjective sleep appreciation	,521**	The more REM sleep the better I rate my sleep
Light sleep	In sleep	,902**	Most of my time is spend in light sleep
	Subjective sleep appreciation	,658**	The more light sleep the better I rate my sleep, has even more impact than REM
Deep sleep	Evening calorie intake	-,494**	The more calories I eat in the evening the less deep sleep I get
Evening calorie intake	HRV evening & HRV morning	Negative*	The more I eat in the evening the lower my HRV in the evening and morning

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

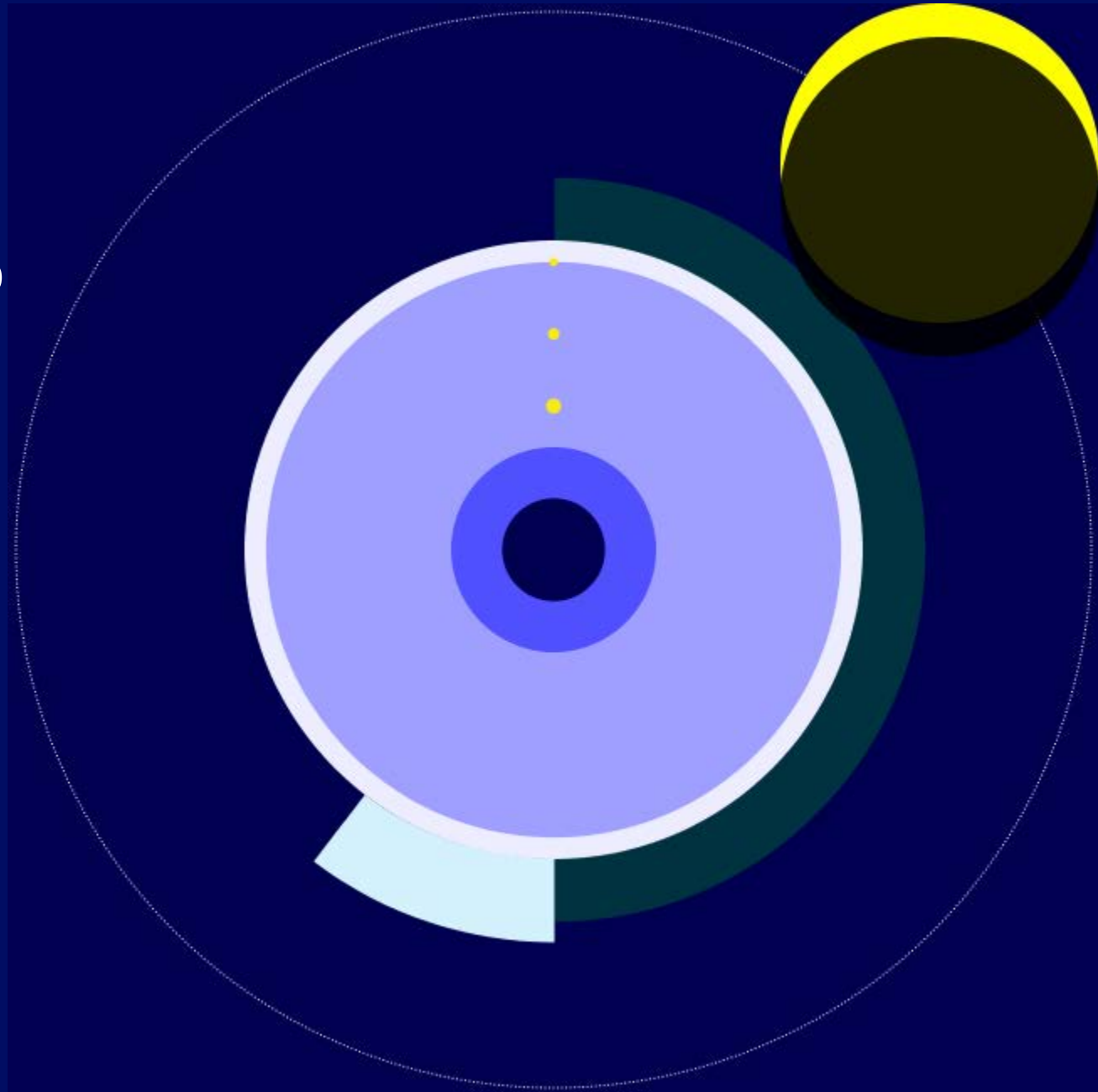
Unexpected correlations

- Awake time - Systole blood pressure positive
- REM sleep - Systole blood pressure negative
- Meditation no correlation



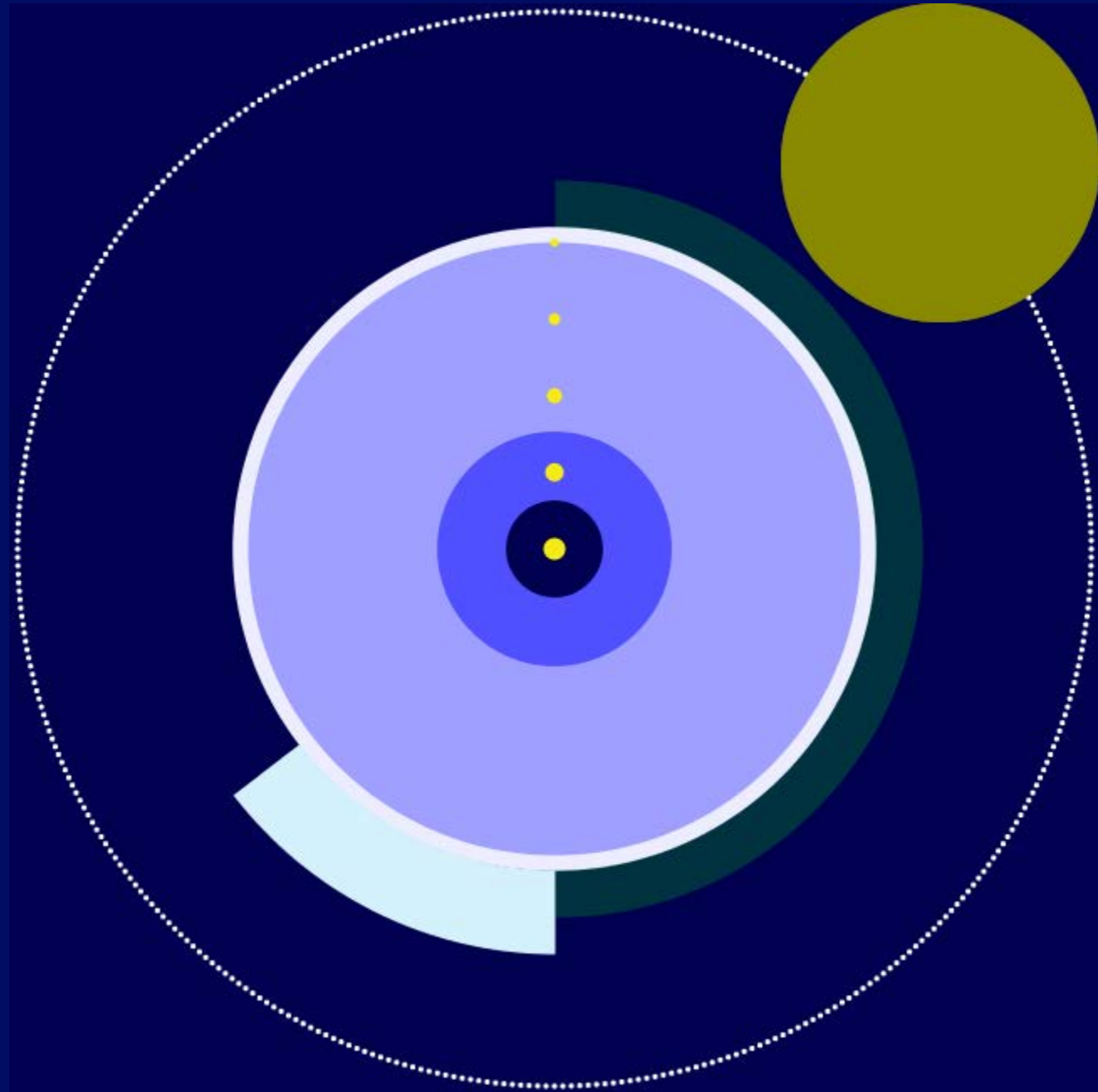
Sleep & calorie intake

- Calorie intake effects deep sleep
- Calorie intake effects HRV

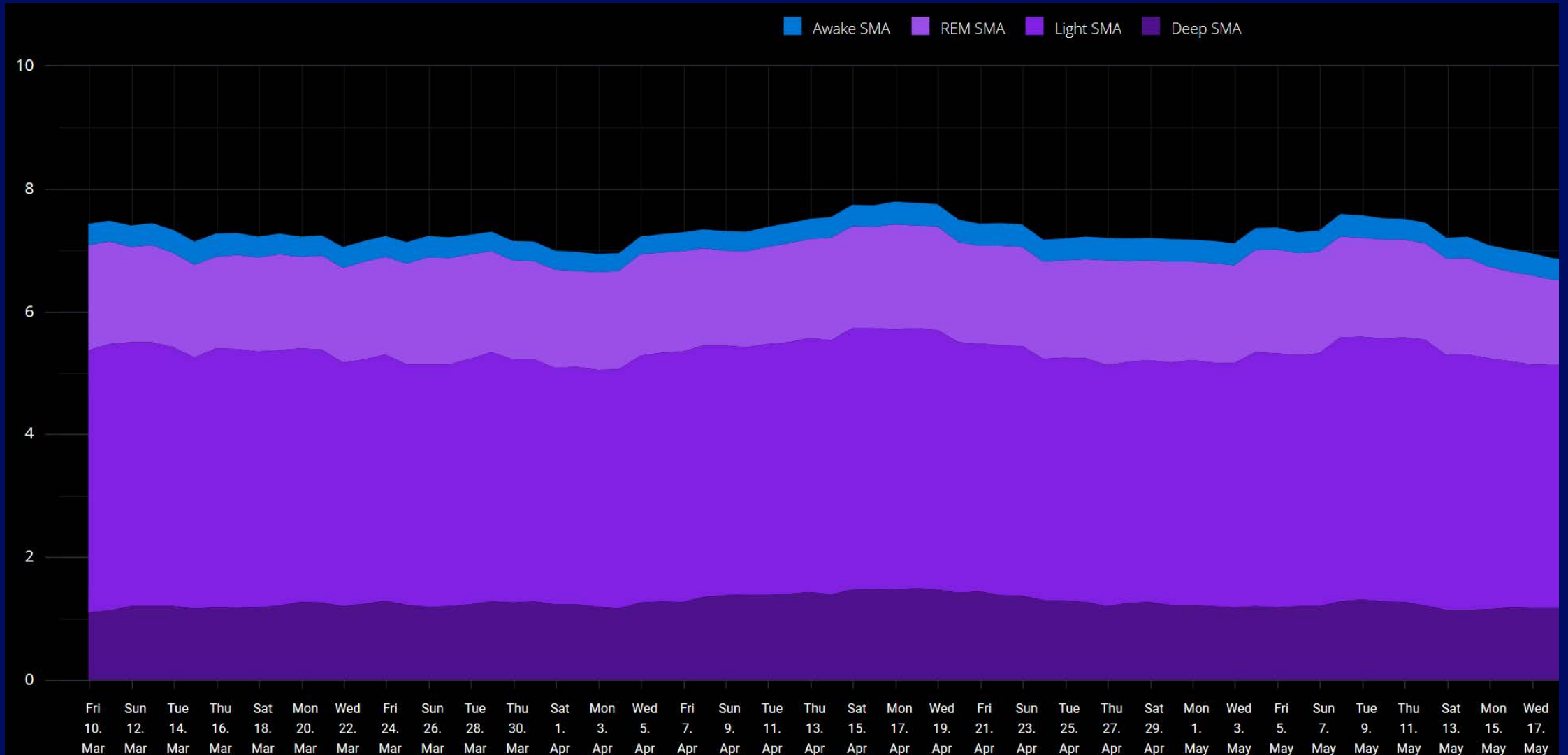


Sleep appreciation

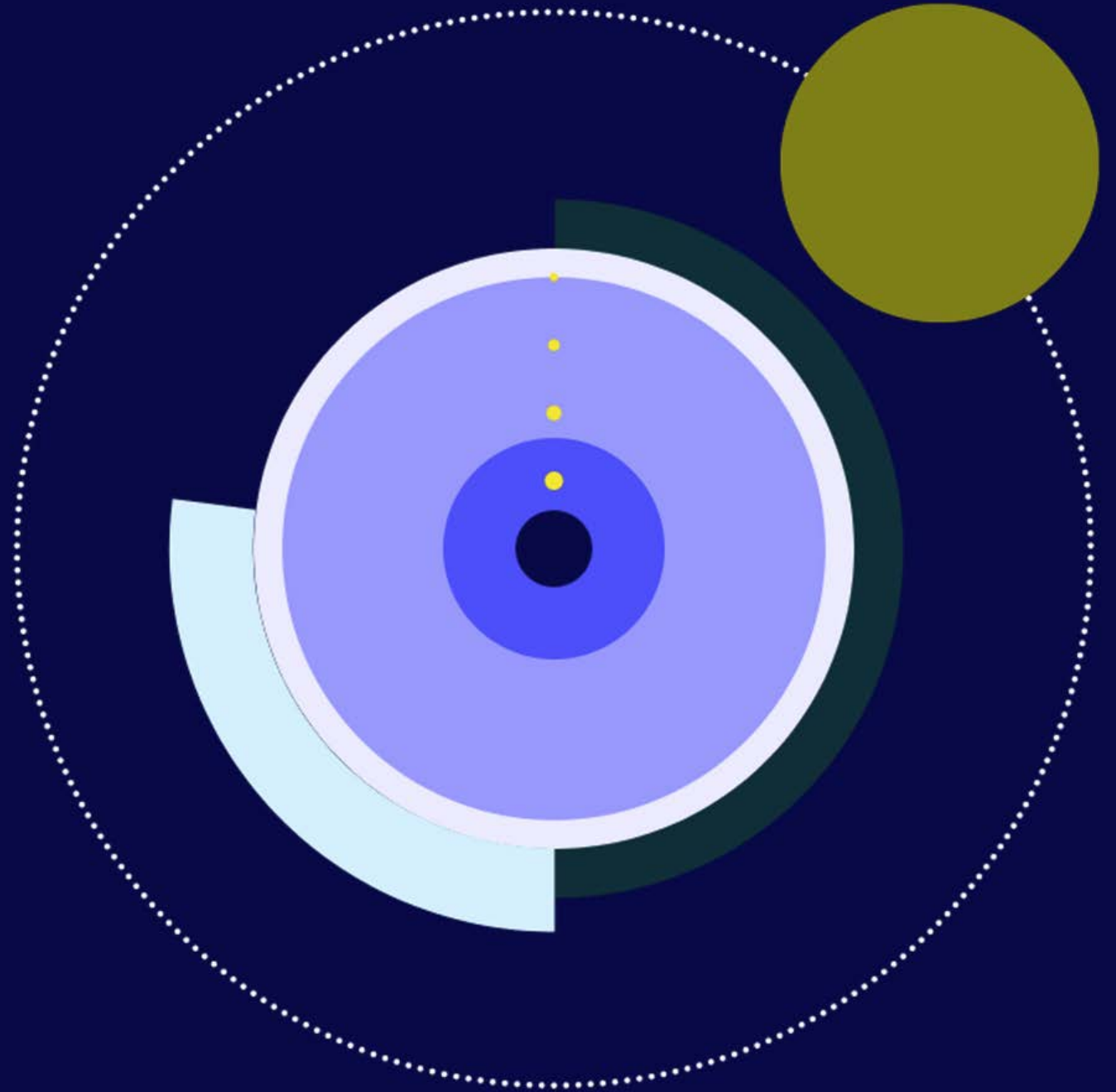
- Light sleep
- REM sleep



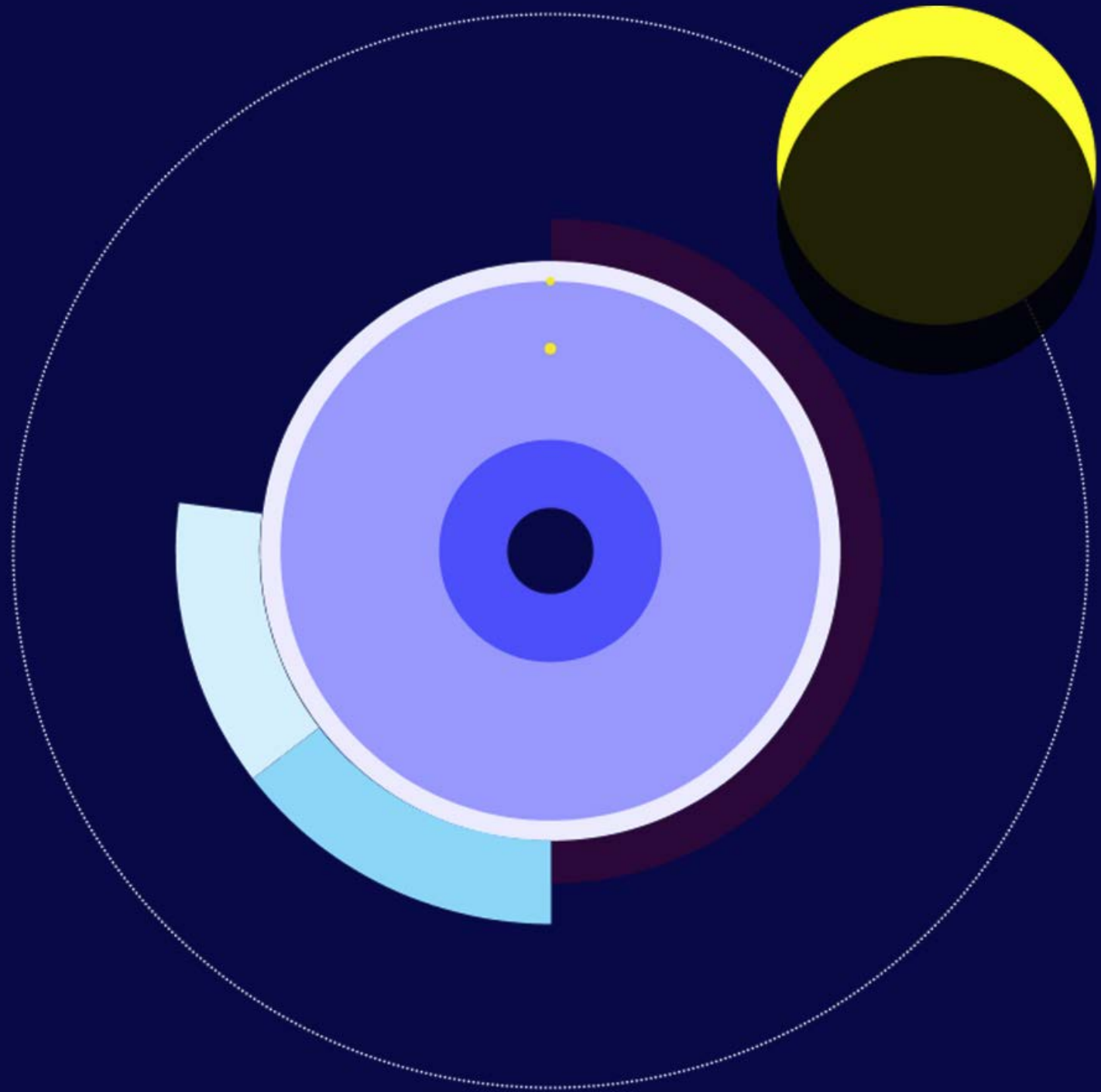
I learned: tracking sleep is hard



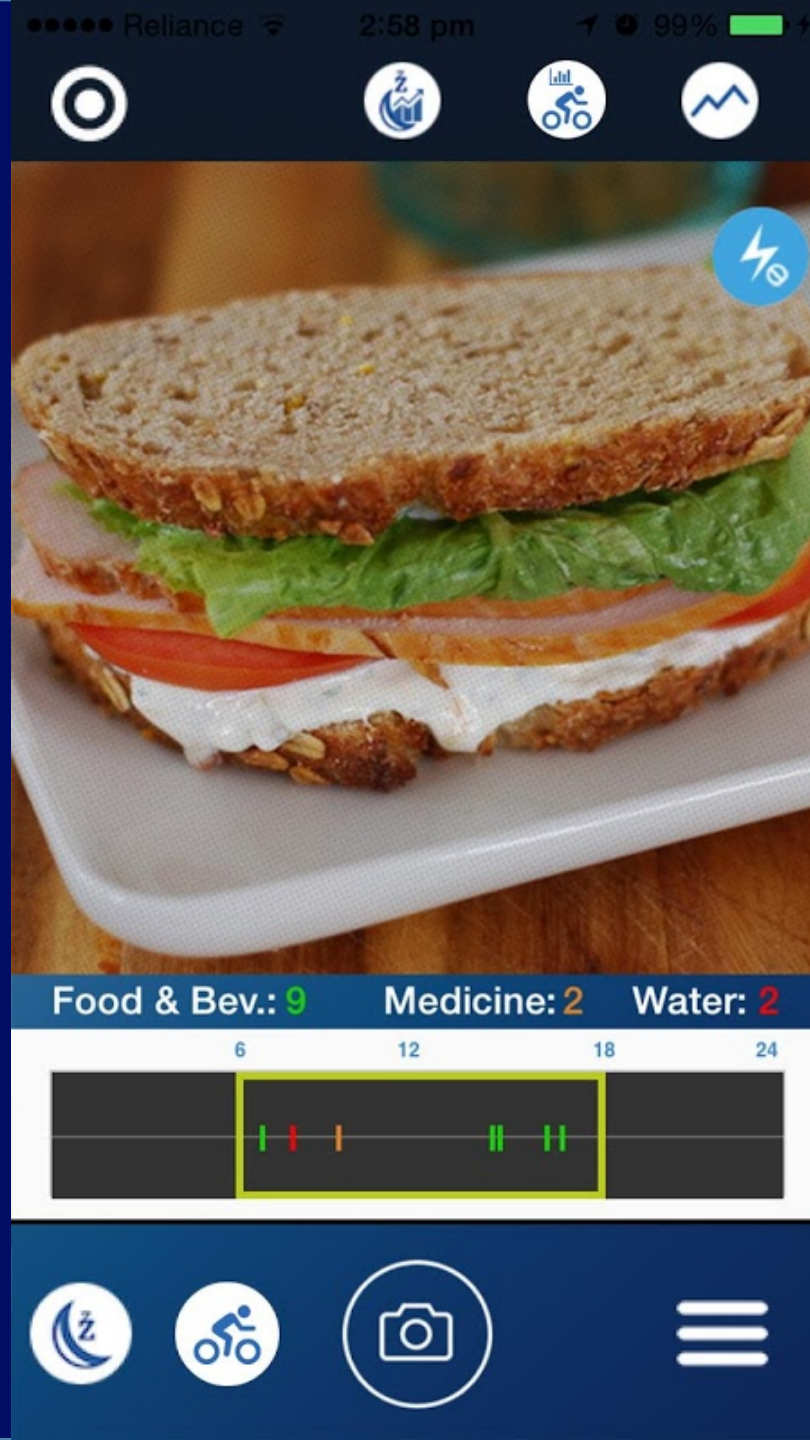
I learned:
Screen time may
not be the culprit



I learned:
Calories count



I learned:
Calories count

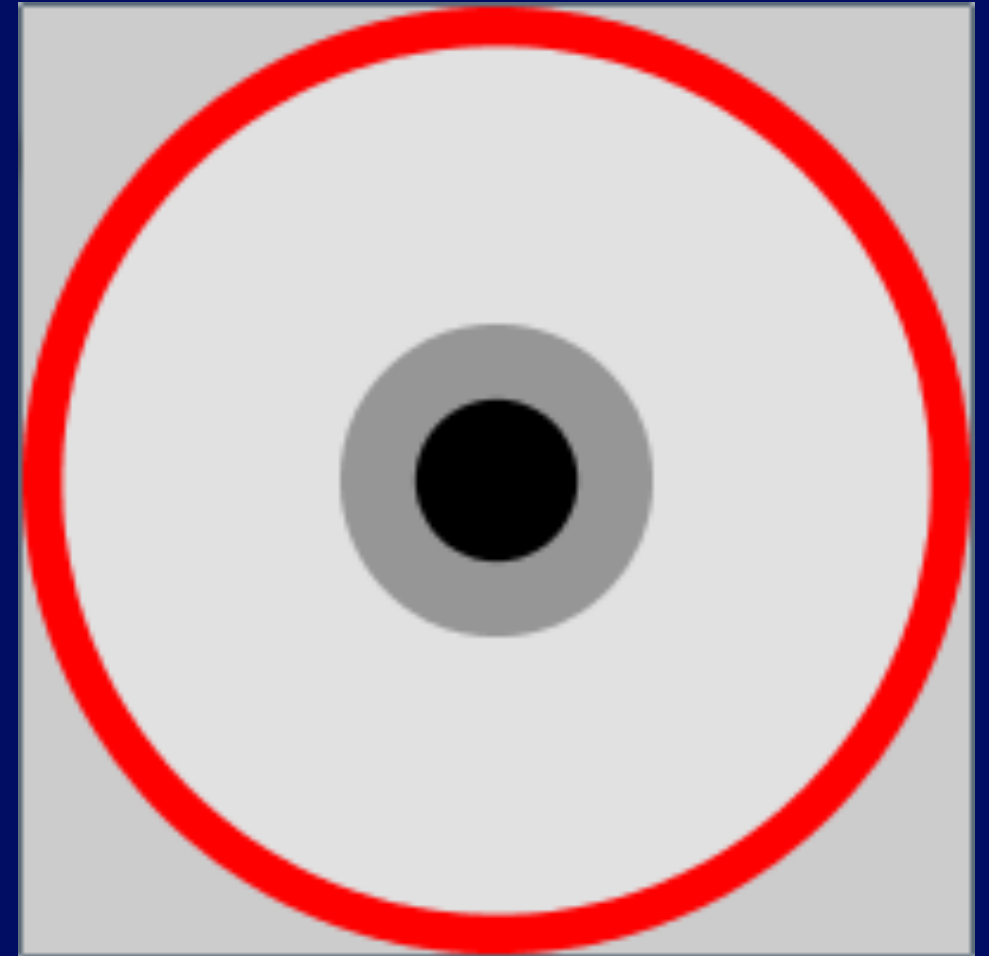
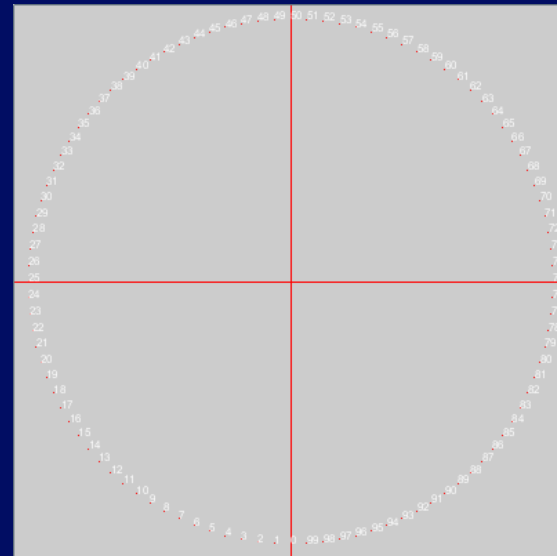
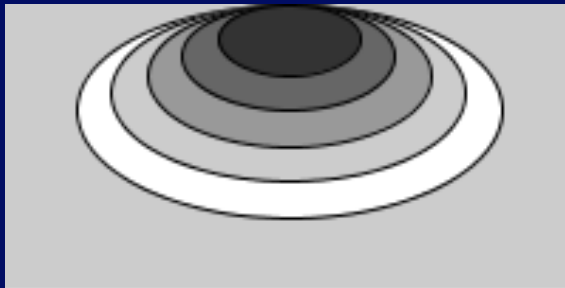
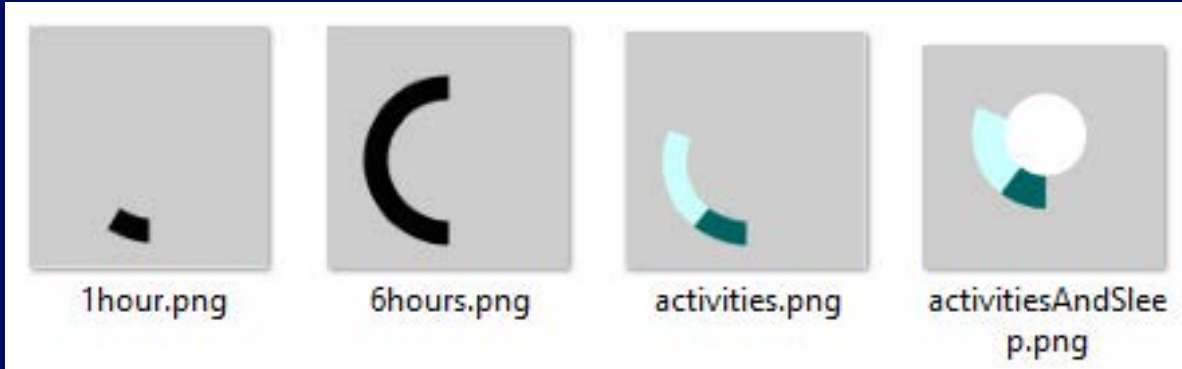


I learned: I love Statistics

Timestamp	Start time	End time s	SportMinu	Feeling soc	Calorie int	Stress
4-2-2016 22:02	18:00:00	19:00:00	1:00:00		680	
5-2-2016 23:59	00:00:00	0:00:00	0:00:00	Positive	100	
8-2-2016 22:01	0:00:00	0:00:00	0:00:00	Negative	0	
9-2-2016 22:12	18:00:00	18:30:00	0:30:00		640	
10-2-2016 22:03	18:30:00	19:20:00	0:50:00		0	
12-2-2016 22:37			0:00:00		0	
14-2-2016 22:50			0:00:00	Positive	750	
15-2-2016 22:27			0:00:00	Neutral	0	
16-2-2016 23:01			0:00:00		160	
17-2-2016 22:44			0:00:00	Positive	700	
18-2-2016 22:07			0:00:00		275	
19-2-2016 22:36			0:00:00		400	
21-2-2016 22:24			0:00:00		325	
23-2-2016 23:02	18:00:00	18:45:00	0:45:00		400	
24-2-2016 23:02	22:35:00	22:55:00	0:20:00		400	
25-2-2016 21:48			0:00:00		800	
26-2-2016 22:13	18:00:00	18:45:00	0:45:00		900	
27-2-2016 23:11			0:00:00		275	
28-2-2016 20:43			0:00:00		350	
2-3-2016 22:41	20:50:00	21:15:00	0:25:00		250	
5-3-2016 22:21	18:30:00	19:00:00	0:30:00		0	
6-3-2016 21:58			0:00:00		0	
7-3-2016 22:29	20:30:00	21:00:00	0:30:00		0	
8-3-2016 22:22	18:00:00	18:45:00	0:45:00		650	
10-3-2016 22:46	18:00:00	18:45:00	0:45:00		225	
11-3-2016 22:32	20:00:00	20:30:00	0:30:00		875	
12-3-2016 22:39			0:00:00		550	
13-3-2016 22:07			0:00:00		350	
14-3-2016 22:45	20:30:00	20:45:00	0:15:00		250	
15-3-2016 23:45	21:45:00	22:15:00	0:30:00	Positive	775	
17-3-2016 22:29			0:00:00		540	
18-3-2016 22:24	18:00:00	18:45:00	0:45:00		600	

Datum	Score	InBed	InSleep	Awake	REM	Light	Deep	hrv_evenir	hrv_morni	Star
5-2-2016	92	8.21	7.55	0.26	1.23	4.53	1.39	61.4	73.1	3
6-2-2016	79	7.08	6.49	0.19	1.13	4.15	1.21	51.2	87.5	2
9-2-2016	93	8.37	8.17	0.2	2.0	5.06	1.1	56.7	96.1	3
10-2-2016	91	8.07	7.47	0.2	1.38	4.4	1.29	51.6	71.3	4
11-2-2016	95	8.30	8.15	0.15	1.58	4.50	1.27	60.5	74.5	3
13-2-2016	96	8.50	7.19	1.31	1.36	4.11	1.29	74.2	85.7	2
15-2-2016	85	7.56	7.41	0.15	2.09	4.39	0.53	61.3	69.9	2
16-2-2016	86	8.13	7.53	0.2	2.02	4.25	1.26	53.0	119.7	4
17-2-2016	67	6.43	5.50			3.13	1.13	77.6	70.6	1
18-2-2016	85	8.05	7.32	0.33	1.	4.25	1.12	69.1	54.3	2
19-2-2016	85	8.22	7.44	0.22	2.1	4.29	1.04	56.0	86.2	4
20-2-2014	96	8.58	8.33	0.25	1.5	5.16	1.21	51.0	78.6	5
22-2-2016	100	9.21	9.08	0.13	2	5.35	1.30	48.5	64.5	5
24-2-2016	83	7.39	7.24	0.15	1.5	4.37	1.08	61.0	74.3	3
25-2-2016	79	7.48	6.53			3.51	1.28	49.9	63.1	2
26-2-2016	89	8.36	8.00	0.36	1.2	5.09	1.26	31.2	78.6	3
27-2-2016	86	9.06	8.01	1.05	2.04	4.51	1.06	52.0	58.7	4
28-2-2016	83	7.42	6.32	1.10	1.10	4.12	1.10	49.9	61.2	1
29-2-2016	95	8.57	8.32	0.25	2.1	5.06	1.14	62.3	63.0	5
3-3-2016	85	8.02	7.26	0.25	1.5	4.22	1.25	27.6	101.8	3
6-3-2016	90	8.17	7.35		1.4	4.29	1.51	48.1	67.0	3
7-3-2016	88	8.38	7.53	0.45	1.45	4.41	1.27	47.4	59.7	4
8-3-2016	91	8.15	7.47	0.28	1.28	4.39	1.39	61.5	72.3	2
9-3-2016	80	8.09	6.12	1.57	1.15	4.11	0.46	43.8	42.5	2
11-3-2016	90	7.45	5.48	1.57	1.07	3.30	1.11	63.4	32.2	2
12-3-2016	83	8.32	7.59	0.33	2.05	5.17	0.36	34.1	54.4	3
13-3-2016	81	7.32	7.15	0.17	1.48	4.15	1.02	35.9	51.4	3
14-3-2016	85	7.54	6.55	0.59	1.14	4.13	1.28	68.0	60.3	2

I learned: The joy of creating



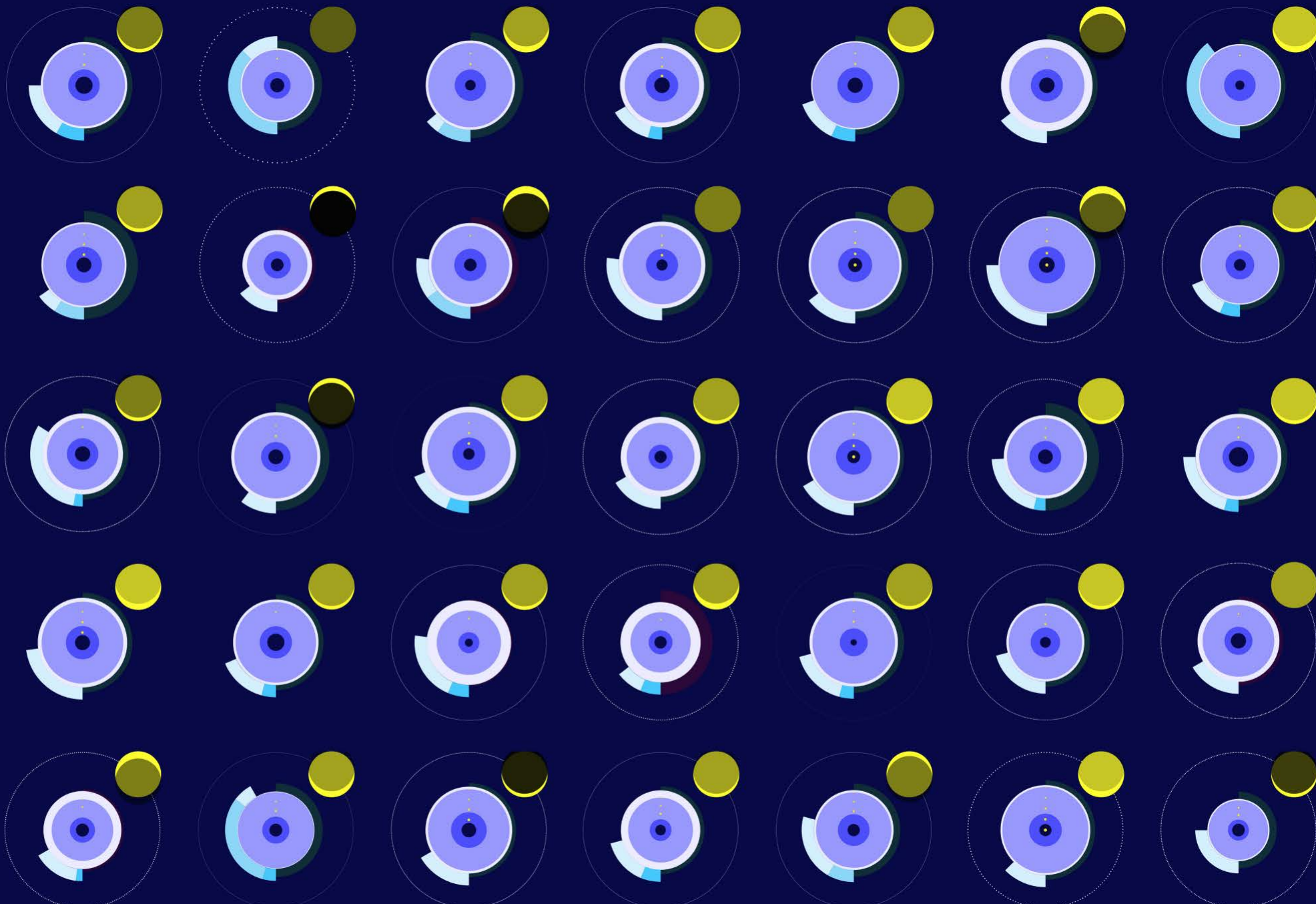
sleepgalaxy

Mean Values

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5

Culture	Health	Quality of Life	Sleep	Stress	Work	Exercise	Environment	Technology	Well-being	Work-life Balance
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sleepgalaxy is an artistic visualisation of 35 nights of sleep during the period of 5-7-2016 and 24-3-2016. Some days are missing due to technical difficulties. Sleep data is coupled with other variables to discover connections between lifestyle and sleep (quality).
 By Danielle Roberts
 Sponsored by Enfit
<http://sleepgalaxy>



Thank you!

Danielle Roberts

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www.awarenesslab.nl

bit.ly/sleepGalaxy // [blog](#)

What
is
this
about?



How
to
use
it?

Underpinning
the
design
of
the
lab
is
a
series
of
12
10x
and
15
10x
lens
eyes
are
worn
by
the
lab
designers.
They
do
a
model
with
the
eyes
to
see
what
the
lab
design
is
like.
By
Danielle
Roberts
Support
by
lab
designers