

### INSTRUCTIONS FOR ASSEMBLING KEPLER STAR WHEELS

- Step 1: Copy Star Wheel and Star Wheel Holder pages on heavy cardstock or use glue stick or doublestick tape to adhere the pages onto a file folder or heavy cardstock.
- Step 2: Cut along the solid outer circle of the Star Wheel and along the solid lines on the Star Wheel Holder, removing the grid areas.

- Step 3: On the Star Wheel Holder, fold along the 3 dotted lines.
- Step 4: Tape the sides so that the Star Wheel Holder forms a pocket for the Star Wheel to go into.
- Step 5: Place the Star Wheel in the Star Wheel Holder.

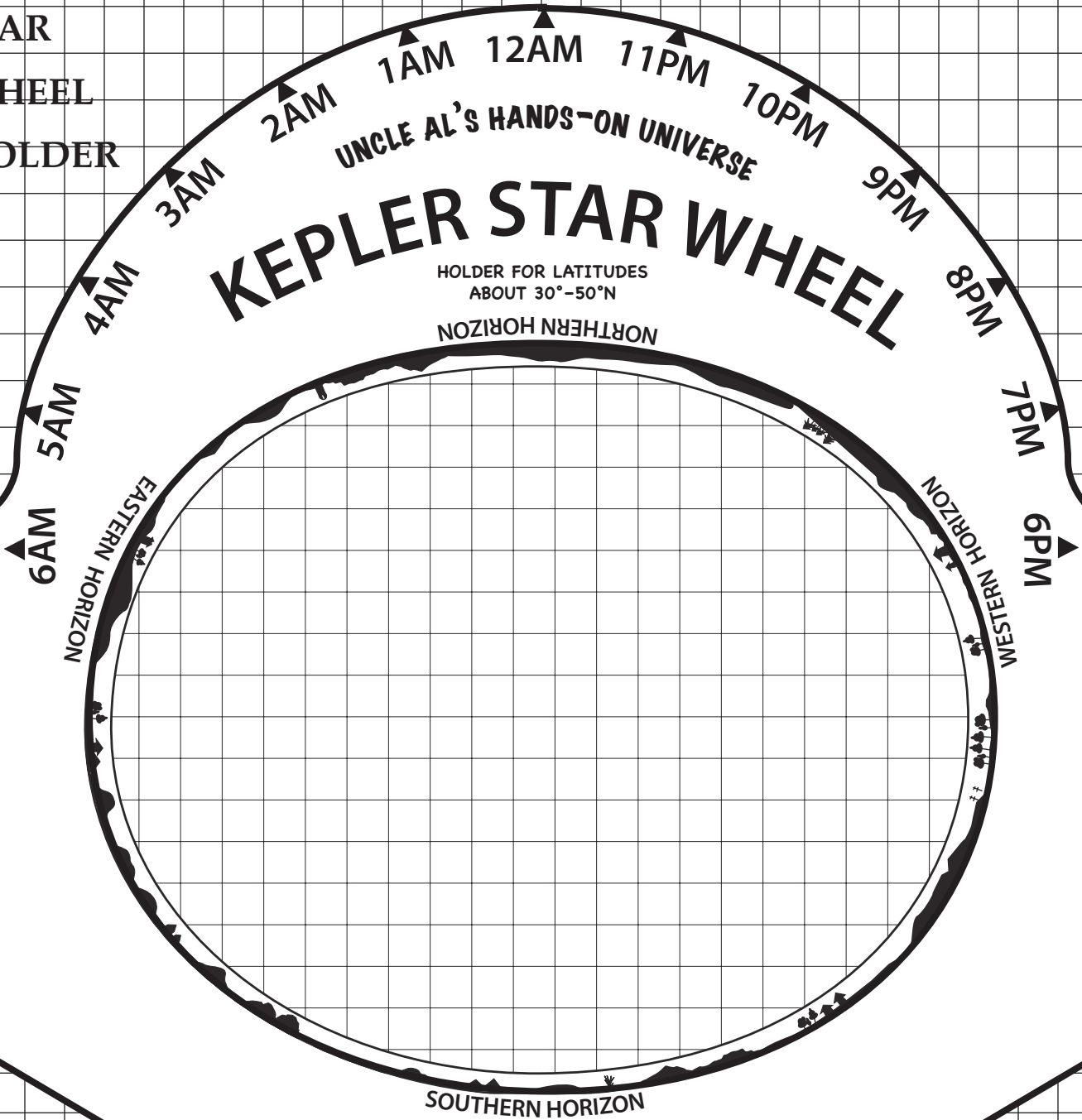
**STAR  
WHEEL  
HOLDER**

**KEPLER STAR WHEEL**

UNCLE AL'S HANDS-ON UNIVERSE

HOLDER FOR LATITUDES  
ABOUT 30°-50°N

NORTHERN HORIZON



Blue squares show the Kepler field of view (CCD array)

Green circles denote stars with exoplanets.  
Star magnitudes are shown for 1st, 2nd, & 3rd mag

Archive of the NASA Kepler Mission website:  
<http://wayback.archive-it.org/8608/20170330180948/https://kepler.nasa.gov/index.cfm>

Version: January 2021

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Uncle Al's Star Wheels are based on LHS Sky Challengers created by Budd Wentz.  
Star Wheels source - <http://www.planetarium-activities.org/shows/ct/starwheels>  
[this site has latest version of starwheels, holders, and a page of star & planet details]

1. Align your date and time, and then look up at the sky
2. Locate the constellation you want to find on the map.
3. Turn your map so the horizon it is closest to is at the bottom.
4. The star positions in the sky should match those on the wheel.

**Instructions for Using Uncle Al's Star Wheels**

Tape

Tape

# STAR/PLANET DETAILS

PLANET NAME	V	RA	DEC	Unit:	Period	Semi-major axis	Planet Mass (min)	Distance	Star Mass	Star Temp	Star Radius
				day	au	mjupiter	pc	msun	k	rsun	
1 beta Gem b	1.15	07:45:19.364	+28:01:34.72	589.64	1.73	2.69	10.36	2	4666	11.01	
2 alpha Ari b	2	02:07:10.286	+23:27:46.00	380	1.18	1.86	20.18	1.5	4553	17.65	
3 gamma Leo A b	2.12	10:19:58.162	+19:50:30.70	428.5	1.19	8.82	39.89	1.23	4300	42.55	
4 gamma Cep b	3.21	23:39:20.982	+77:37:55.08	905.57	2.14	1.77	14.1	1.59	4888	5.01	
5 iota Dra b	3.29	15:24:55.784	+58:57:57.68	511.1	1.53	12.72	31.03	1.82	4545	11.99	
6 epsilon Tau b	3.53	04:28:36.933	+19:10:49.88	594.9	1.93	7.62	44.96	2.7	4901	12.28	
7 epsilon Eri b	3.72	03:32:56.422	-09:27:29.90	2500	3.38	1.05	3.22	0.82	5145	0.74	
8 7 CMa b	3.95	06:36:40.999	-19:15:20.55	763	1.88	2.65	19.75	1.52	4792	2.3	
9 upsilon And c	4.1	01:36:47.977	+41:24:22.99	241.33	0.83	1.92	13.49	1.31	6212	1.38	
upsilon And d	4.1	01:36:47.977	+41:24:22.99	1278.12	2.52	4.12	13.49	1.31	6212	1.38	
upsilon And b	4.1	01:36:47.977	+41:24:22.99	4.62	0.06	0.67	13.49	1.31	6212	1.38	
10 HD 60532 b	4.45	07:34:03.206	-22:17:46.25	201.3	0.76	1.03	25.3	1.44	6095	2.35	
HD 60532 c	4.45	07:34:03.206	-22:17:46.25	604	1.58	2.46	25.3	1.44	6095	2.35	
11 tau Boo b	4.5	13:47:16.037	+17:27:24.39	3.31	0.05	4.12	15.62	1.34	6387	1.42	
12 xi Aql b	4.71	19:54:14.822	+08:27:41.94	136.75	0.68	2.81	56.27	2.2	4780	10.45	
13 11 Com b	4.78	12:20:43.093	+17:47:33.55	326.03	1.29	19.43	88.89	2.7	4742	18.39	
14 kappa CrB b	4.79	15:51:13.937	+35:39:29.62	1261.94	2.8	2.01	31.1	1.84	4970	3.52	
15 42 Dra b	4.83	18:25:58.988	+65:33:48.77	479.1	1.19	3.89	96.53	0.98	4200	36.15	
16 61 Vir c	4.87	13:18:24.972	-18:18:31.00	38.02	0.22	0.03	8.56	0.94	5571	0.98	
61 Vir d	4.87	13:18:24.972	-18:18:31.00	123.01	0.47	0.07	8.56	0.94	5571	0.98	
61 Vir b	4.87	13:18:24.972	-18:18:31.00	4.22	0.05	0.02	8.56	0.94	5571	0.98	
17 70 Vir b	4.97	13:28:25.950	+13:46:48.68	116.69	0.48	7.46	17.99	1.1	5544	1.6	

## Abbreviations:

RA - Right Ascension

DEC - Declination

V - Magnitude of star

## Greek letters used

α alpha

β beta

γ gamma

ε epsilon

κ kappa

ξ xi

And - Andromeda

Aql - Aquila

Ari - Aries

Boo - Boötes

Cep - Cepheus

Cma - Canis Major

Com - Coma Berenices

CrB - Corona Borealis

Dra - Draco

Eri - Eridanus

Gem - Gemini

Tau - Taurus

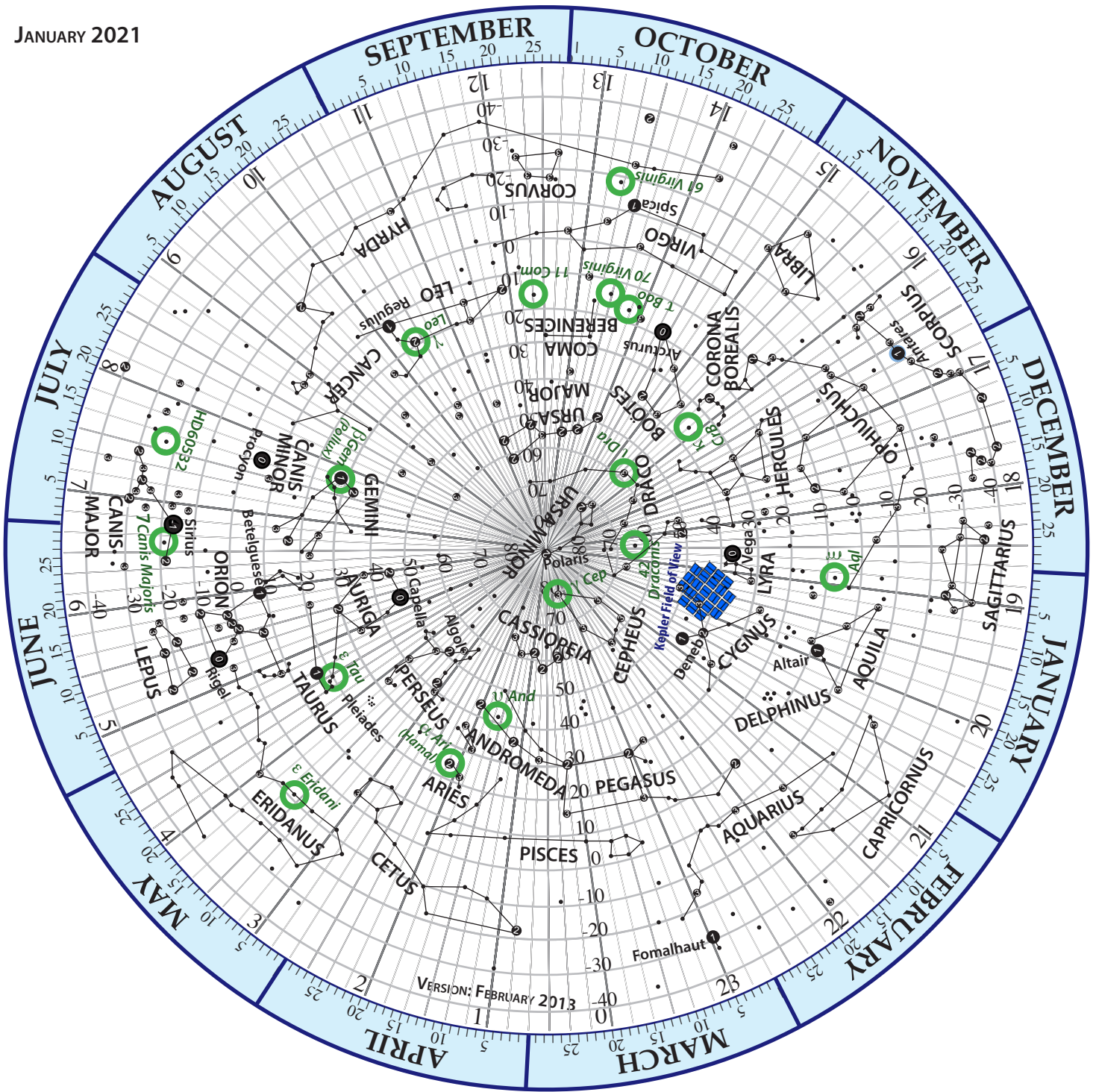
Vir - Virgo

HD - Henry Draper catalog #

b - 1st planet discovered

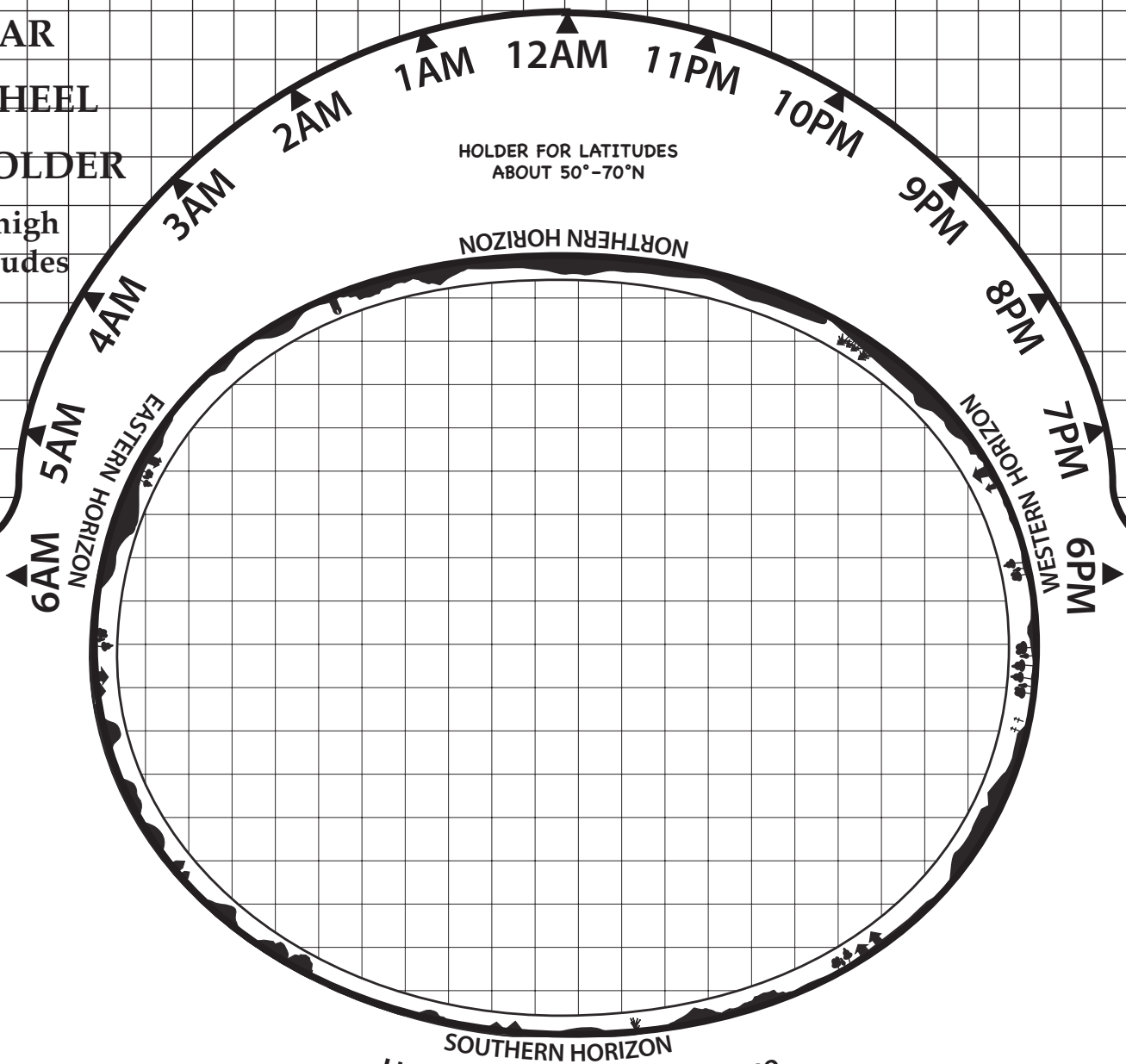
c - 2nd planet discovered

d - 3rd planet discovered



# STAR WHEEL HOLDER

for high latitudes



Blue squares show the Kepler field of view (CCD array)

Green circles denote stars with exoplanets. Star magnitudes are shown for 1st, 2nd, & 3rd mag

## Uncle Al's Hands-On Universe Kepler Star Wheel

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