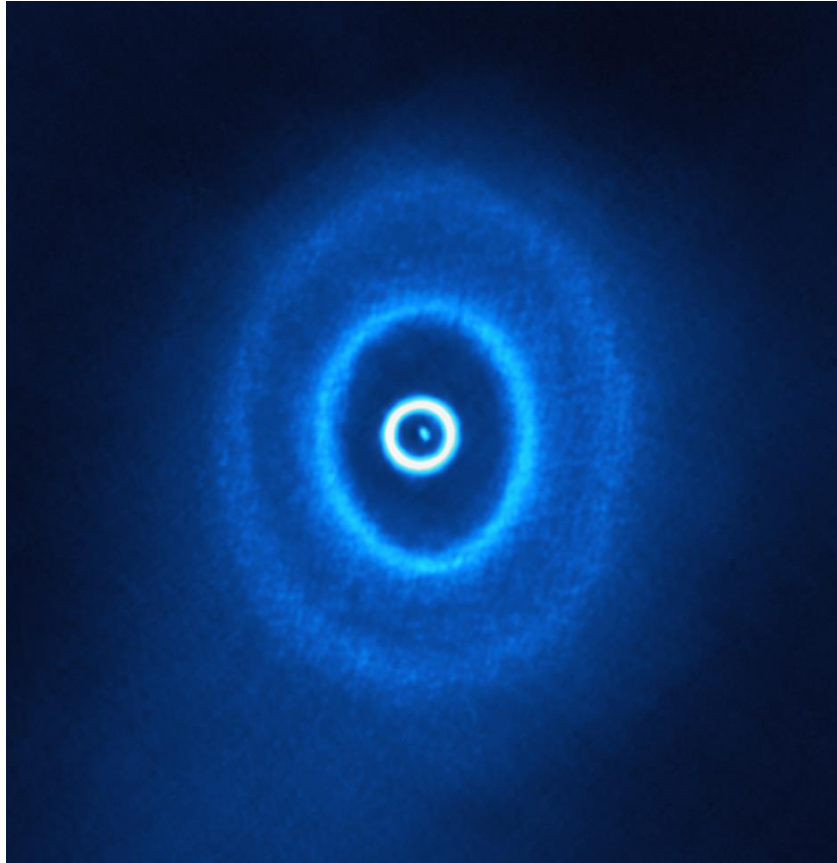


## Knit Kit No. 2 - Of Ripples and Rings



*Image Credit: Kraus et al. 2020, ALMA (ESO/NAOJ/NRAO), ESO/Exeter*

These serene ripples hide a struggle, as three stars tear up their surroundings.

### **The Story**

Alison Young

I was very excited when we first saw the telescope images that showed there is actually a torn-off ring of gas; it was beautiful to see. In this project that I have been working on for a few years, my boss, Matthew Bate, and I made a computer model. We followed the stars for many years with our telescopes, and worked out their paths. The model used their paths to work out that some of the gas and dust would be torn into a new ring. It was clear that this was a fascinating system when we noticed this unusual shape appear in the model.

### **The Science**

This is an image from a type of telescope called a “millimetre-wave” telescope, it sees light a bit like radio waves, which radios and TVs pick up. It shows a disc of spread-out dust and gas around a three-sun system. The image shows bright rings because the hot dust is glowing like hot coals, just colder - so it glows a different colour, in millimeter waves. Something is trapping dust into these rings and we aren't sure why that is yet. What's more,

The inner ring has broken off from the rest of the disc altogether, and is tilted compared to the two outer rings. The rings are enormous - the orbits of the eight planets in our Solar System fit easily within the innermost ring.

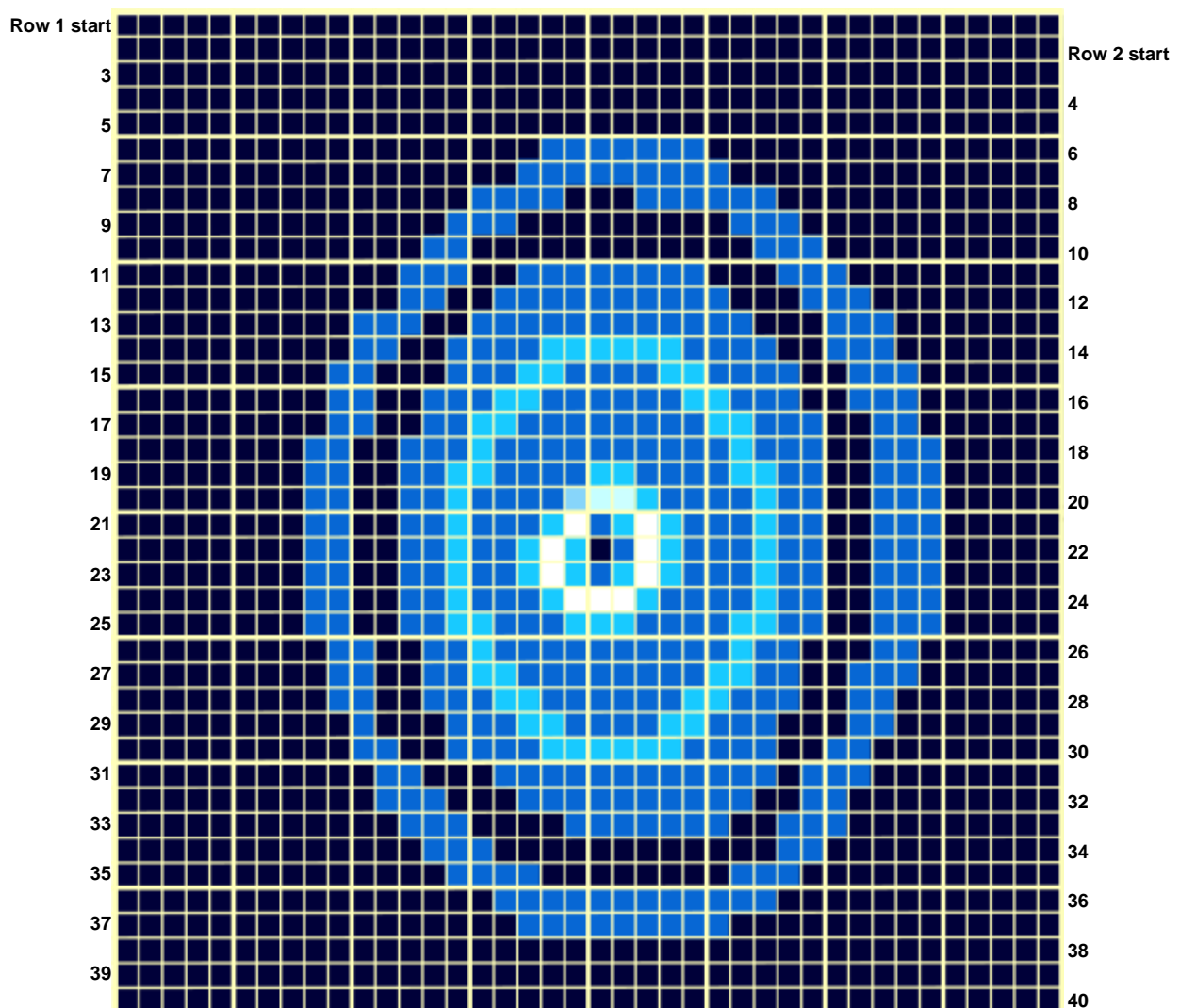
This is an intermediate knit. You will need:

- 4 colours of wool - we used black, two shades of blue, and white.
- A pair of knitting needles

And that's it!

Colours don't have to match the image. In fact, the image above has been recoloured. Because the scientists aren't looking at visible light, they use whichever colour scheme works well for them. So you can use whatever you or your family have lying around. In this knit, we used around 25g of black, 10g of medium blue, 10g of light blue, 5g of white DK wool. With this thickness, we suggest 4mm knitting needles.

Skills used include: Cast On, Knit, Purl, Change Colour, and Cast Off. Go to our website [www.knittheuniverse.co.uk](http://www.knittheuniverse.co.uk) for links to handy YouTube videos to learn these skills. Remember: After casting on, knit odd-numbered rows, changing colours as you go, and purl even numbered rows, changing colours as you go.



## Knitting Pattern

k – Knit      p– Purl                                      b – Black      m – Medium blue      l – Light blue      w- White  
Brackets indicate stitches inside the brackets are repeated.

For example, p2b means purl 2 stitches in black, and (k1r, k1b) twice means knit 1 stitch in red, 1 stitch in black, and do this twice.

Cast on 40 stitches in black (or an alternate colour).

Row 1-5: Knit odd rows, purl even rows

Row 6: p15b, p7m, p18b

Row 7: k17b, k9m, k14b

Row 8: p12b, p6m, p3b, p4m, p15b

Row 9: k14b, k3m, k9b, k3m, k11b

Row 10: p10b, p3m, p12b, p2m, p13b

Row 11: k12b, k3m, k2b, k8m, k3b, k3m, k9b

Row 12: p8b, p3m, p3b, p10m, p2b, p2m, p12b

Row 13: k10b, k3m, k2b, k12m, k3b, k3m, k7b

Row 14: p7b, p3m, p2b, p4m, p6l, p4m, p2b, p2m, p10b

Row 15: k9b, k2m, k3b, k3m, k2l, k4m, k2l, k4m, k2b, k3m, k6b

Row 16: p6b, p3m, p2b, p3m, p2l, p6m, p2l, p3m, p2b, p2m, p9b

Row 17: k9b, k2m, k2b, k2m, k2l, k8m, k2l, k3m, k2b, k2m, k6b

Row 18: p5b, p3m, p2b, p3m, p1l, p10m, p1l, p3m, p2b, p2m, p8b

Row 19: k8b, k2m, k2b, k2m, k2l, k4m, k2l, k4m, k2l, k2m, k2b, k3m, k5b

Row 20: p5b, p3m, p2b, p2m, p1l, p4m, p1l, p2w, p1l, p4m, p1l, p2m, p2b, p2m, p8b

Row 21: k8b, k2m, k2b, k2m, k1l, k3m, k1l, k1w, k1m, k1l, k1w, k1l, k3m, k1l, k2m, k2b, k3m, k5b

Row 22: p5b, p3m, p2b, p2m, p1l, p3m, p1l, p1w, p1m, p1b, p1l, p1w, p1l, p2m, p1l, p2m, p2b, p2m, p8b

Row 23: k8b, k2m, k2b, k2m, k1l, k2m, k1l, k1w, k1l, k1m, k1l, k1w, k1l, k3m, k1l, k2m, k2b, k3m, k5b

Row 24: p5b, p3m, p2b, p2m, p1l, p4m, p1l, p3w, p1l, p3m, p1l, p2m, p2b, p2m, p8b

Row 25: k8b, k2m, k2b, k2m, k2l, k3m, k3l, k4m, k2l, k2m, k2b, k3m, k5b

Row 26: p6b, p2m, p3b, p2m, p1l, p10m, p1l, p2m, p2b, p2m, p9b

Row 27: k9b, k2m, k2b, k2m, k2l, k8m, k2l, k2m, k2b, k3m, k6b

Row 28: p7b, p2m, p2b, p3m, p2l, p6m, p2l, p3m, p2b, p2m, p9b

Row 29: k10b, k1m, k3b, k3m, k2l, k4m, k2l, k3m, k3b, k2m, k7b

Row 30: p8b, p2m, p2b, p4m, p6l, p4m, p2b, p2m, p10b

Row 31: k11b, k2m, k3b, k12m, k1b, k3m, k8b

Row 32: p9b, p2m, p2b, p10m, p3b, p3m, p11b

Row 33: k12b, k3m, k4b, k7m, k2b, k3m, k9b

Row 34: p10b, p2m, p12b, p3m, p13b

Row 35: k14b, k4m, k8b, k3m, k11b

Row 36: p12b, p12m, p16b

Row 37: k17b, k9m, k14b

Row 38-40: Using black, purl even rows, knit odd rows

Cast off.