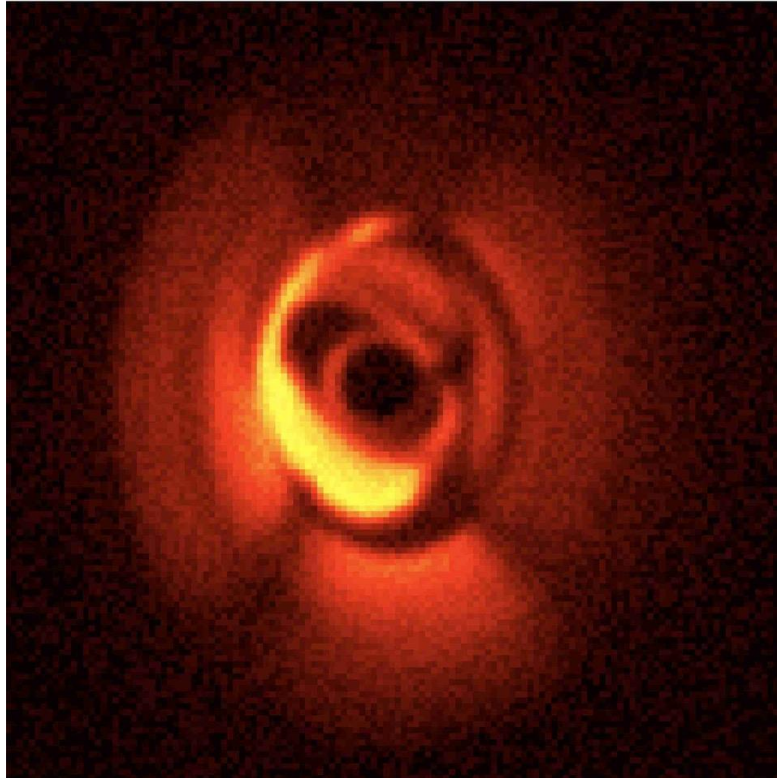


## Knit Kit No. 1 - A Rose in the Reaches



*From Kraus, S., Kreplin, A., Young, A. K., Bate, M. R., Monnier, J. D., Harries, T. J., Avenhaus, H., Kluska, J., Laws, A. S. E., Rich, E. A., Willson, M., Aarnio, A. N., Adams, F. C., Andrews, S. M., Anugu, N., Bae, J., ten Brummelaar, T., Calvet, N., Curé, M., ... Zhu, Z. (2020). A triple-star system with a misaligned and warped circumstellar disk shaped by disk tearing. *Science*, 369(6508), 1233–1238. <https://doi.org/10.1126/science.aba4633>. Reprinted with permission from AAAS.*

What do you see? A flower? A rose? Each petal is full of promise - the promise of a planet perhaps.

### **The Story**

Prof. Stefan Kraus

In the parable of the blind men and an elephant, a group of blind men come across an elephant and try to imagine what an elephant is by touching it. Each person feels a different part, such as its side, tusk, or tail, and all think it's a different animal. In the same way, in astronomy we often study objects in space with different types of light, and end up seeing different aspects. The images can be beautiful, like this one. We 'see' different parts because we are looking with different 'eyes'.

### **The Science**

Astronomers often make computer models of how star systems are made. This helps us to understand what they see in space. Usually, stars are born out of swirling discs of gas and dust in space. Once the star is born, the leftover gas and dust leaves a wide ring around the young star, which can form into planets after a long time.

In 2020, for the first time, astronomers discovered three young stars orbiting each other, with three swirling discs meeting at different angles. They found them in the constellation Orion in the far reaches of our galaxy almost 900 light years away. The discs have been stirred and broken up by the gravity of the stars. It was the first time anything like this has ever been seen. The three stars in the centre are far too small to see without zooming in, but you can see parts of the three rings around the stars if you know what to look for. We think they look like rose petals, what do you see?

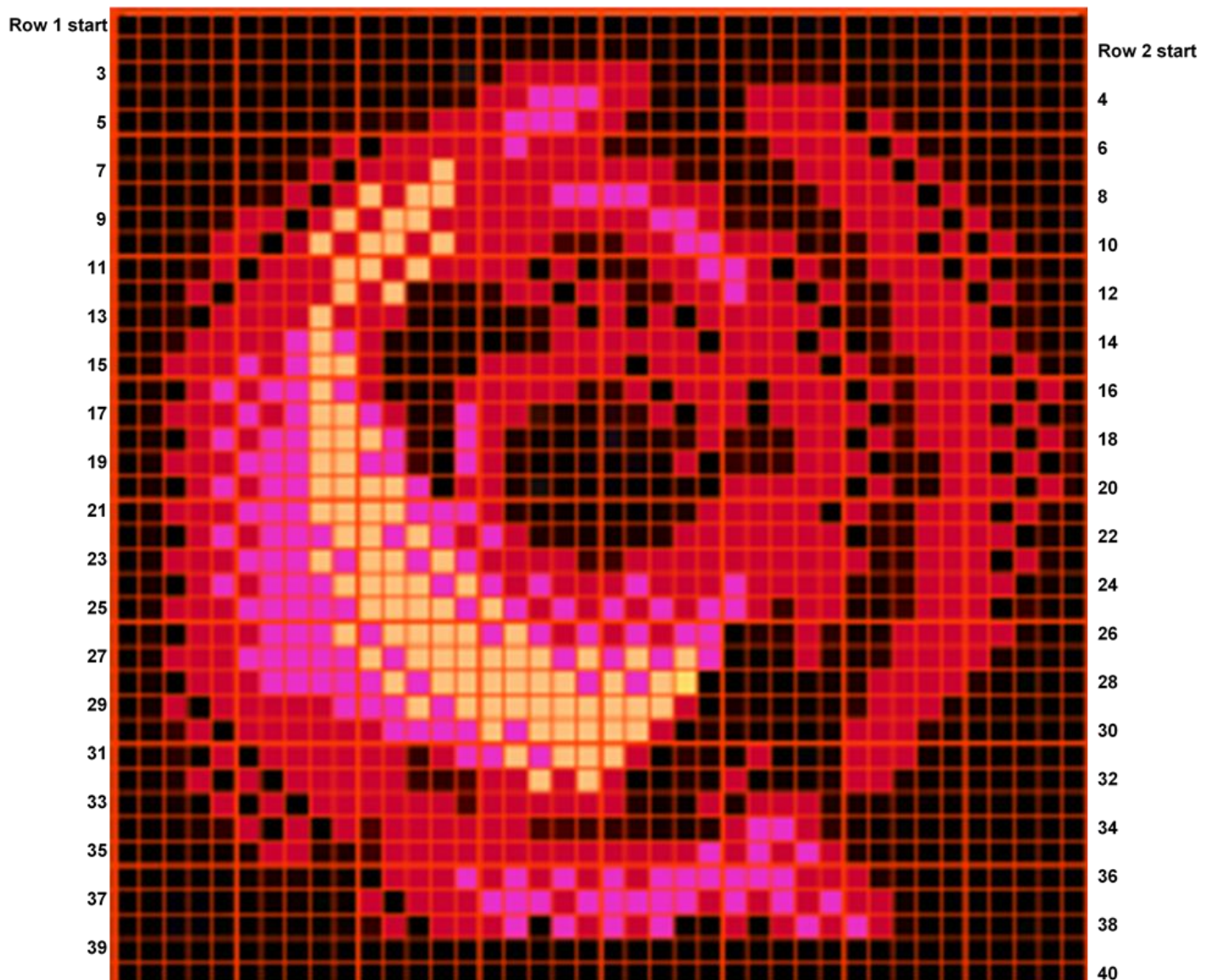
This is a complex knit. You will need:

- 4 colours of wool - we used black, red, pink, and yellow.
  - A pair of knitting needles
- And that's it!

If you can use double-knit (DK) wool and 4mm needles, your knitting will work out around 15-18cm on each side, but use what you have or what you can get hold of.

Colours don't have to match the image, you can use whatever you or your family have lying around. In this knit, we used around 25g of black, 10g of plum, magenta and pale peach. It was knitted on 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      r – Red                      p – Pink                      y- Yellow  
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: Knit all

Row 2: Purl all

Row 3: K16b, K6r, K18b

Row 4: P10b, P4r, P4b, P2r, P3p, P2r, P15b

Row 5: K13b, K3r, K3p, K2r, K5b, K4r, K1b, K1r, K8b

Row 6: P7b, P1r, P1b, P4r, P7b, P3r, P1p, P5r, P1b, P1r, P9b

Row 7: K8b, K1r, K1b, K3r, K1y, K9r, K5b, K4r, K1b, K1r, K6b

Row 8: P5b, P1r, P1b, P4r, P4b, P3r, P4p, P4r, P2y, P1r, P1y, P1r, P1b, P1r, P7b

Row 9: K5b, K2r, K1b, K1r, K1y, K1r, K2y, K9r, K2p, K1r, K5b, K4r, K1b, K1r, K4b

Row 10: P3b, (P1r, P1b) twice, P2r, P3b, P3r, P2p, P2r, P3b, P4r, P1y, P1r, P2y, P1r, P1y, P1r, P1b, P2r, P4b

Row 11: K4b, K1r, K1b, K3r, K2y, K1r, K1y, K4r, K1b, K1r, K3b, K2r, K2p, K1r, K1b, K1r, K2b, K3r, K1b, K1r, K4b

Row 12: P3b, P1r, P1b, P3r, P2b, P1r, P1b, P2r, P1p, P2r, P2b, P2r, P1b, P2r, P4b, P1y, P1r, P1y, P4r, P1b, P1r, P3r

Row 13: K4b, K4r, K1y, K3r, K6b, (K1r, K1b) 3 times, K5r, K3b, K4r, K4b

Row 14: P3b, P5r, P2b, P1r, P1b, P3r, P1b, P6r, P7b, P1r, P1p, P1y, P1p, P4r, P3b

Row 15: K2b, K3r, K1p, K1r, K1p, K2y, K1r, K4b, K6r, K1b, K7r, K1b, K1r, K2b, K3r, K1b, K1r, K2b

Row 16: P1b, P1r, P1b, P4r, P1b, P1r, (P1b, P3r) twice, P1b, P1r, P2b, P5r, P3b, P1r, P1p, P1y, P2p, P1r, P1p, P1r, P3b

Row 17: K2b, K3r, K1p, K1r, K1p, K2y, K1p, K1r, K2b, K1p, K2r, K5b, K1r, K1b, K2r, K1b, K4r, K2b, K3r, K1b, K1r, K2b

Row 18: P1b, P1r, P1b, P4r, P1b, P1r, P1b, P2r, P3b, P1r, P8b, P1r, P1p, P2b, P1p, P3y, P2p, P1r, P1p, P1r, P3b

Row 19: K2b, K3r, K3p, K2y, K2p, K2b, K1p, K1r, K7b, K1r, K4b, K3r, K3b, K2r, K1b, K1r, K2b

Row 20: P1b, P1r, P1b, P3r, P2b, P1r, P1b, P5r, P9b, P2r, P1b, P1p, P4y, P2p, P1r, P1p, P1r, P3b

Row 21: K2b, K3r, K3p, K4y, K3p, K1r, K8b, K5r, K1b, K1r, K2b, K3r, K1b, K1r, K2b

Row 22: P3b, P4r, P3b, P7r, P6b, (P1r, P1p) twice, P1y, P1p, P2y, P3p, P1r, P1p, P1r, P3b

Row 23: K2b, K3r, K3p, K1y, K1p, K2y, K1p, K1y, K1p, K4r, K2b, K10r, K2b, K3r, K1b, K1r, K2b

Row 24: P3b, P4r, P3b, P4r, (P1p, P3r) twice, P1p, P1r, P1p, P1y, P1p, P4y, P3p, P1r, P1p, P1r, P3b

Row 25: K2b, K3r, K5p, K4y, K1p, K1y, (K1p, K1r) 4 times, K2p, K1r, K1b, K2r, K3b, K3r, K4b

Row 26: P3b, P5r, P3b, P1r, P3b, P2p, (P1r, P1p) 3 times, P1y, P1p, P4y, P1p, P1y, P3p, P3r, P3b

Row 27: K2b, K3r, K5p, K1y, K1p, K6y, (K1p, K1y) 3 times, K1p, K3b, K1r, K3b, K4r, K4b

Row 28: P5b, P4r, P7b, P2y, P1p, P1y, P1p, P6y, P1p, P1y, P5p, P3r, P3b

Row 29: K2b, K1r, K1b, K5r, K3p, K1y, K1p, K9y, K1r, K7b, K3r, K6b

Row 30: P7b, P3r, P7b, P1r, P5y, P1p, P1y, P4p, P6r, P1b, P1r, P3b

Row 31: K4b, K1r, K1b, K6r, K1b, K1r, K2p, K1y, K1p, K3y, K1r, K4b, K1r, K3b, K3r, K7b

Row 32: P8b, P2r, P4b, P1r, P4b, (P1r, P1y) twice, P2r, P3b, P5r, (P1b, P1r) twice, P3b

Row 33: K4b, (K1r, K1b) twice, K6r, K1b, K6r, K3b, K1r, K1b, K3r, K11b

Row 34: P11b, P1r, P2p, P1r, P8b, P6r, (P1b, P1r) 3 times, P5b

Row 35: K6b, K2r, K3b, K13r, (K1p, K1r) 3 times, K10b

Row 36: P9b, P3r, P6p, (P1r, P1p) 4 times, P3r, P11b

Row 37: K10b, K1r, K1b, K3r, K3p, K1r, K5p, (K1r, K1p) 3 times, K2r, K8b

Row 38: P8b, (P1r, P1p) twice, P1r, P1b, P1r, P2b, (P1p, P1r) twice, P1p, P1b, P1p, P3r, P1b, P1r, P11b

Row 39-40: Using black, knit one row, purl one row

Cast off.