

Dark digits

In April this year, astronomers working on the Event Horizon Telescope captured the first direct images of a black hole and its “shadow” – the glowing ring of gas and dust trapped in a disc around them. Inspired by this revolutionary discovery, *Physics World* reader **Michael Metcalf** has created a variant of a traditional sudoku so that it begins with a central shadow surrounded by a bright region. Test your mettle over the holidays. We will share the solution next February.



EHT Collaboration

Each number from 1 to 16 must appear once in each row, column and 4 × 4 box, as well as in each of the two diagonals (X-sudoku).

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|----|----|----|----|----|----|---|----|----|----|----|----|----|----|----|----|
| | | | | | | | 12 | 7 | | | | | | | |
| | | | | 4 | 2 | | 8 | 12 | | 11 | 3 | | | | |
| | | 12 | 3 | 15 | 5 | 6 | 11 | 10 | 8 | 14 | 16 | 2 | 4 | 9 | |
| | | | 13 | | 14 | | 10 | 4 | | 2 | 1 | 6 | | | |
| | | 11 | 1 | | | | | | | | | 14 | 3 | | |
| 14 | 8 | 5 | 16 | | | | | | | | | | 13 | 2 | |
| 3 | 2 | 6 | | | | | | | | | | | 7 | 12 | 9 |
| 12 | 13 | 9 | | | | | 2 | | | | | 5 | 11 | 8 | 16 |
| 13 | 9 | 7 | 4 | | | | | 3 | | | | | 10 | 16 | 6 |
| 16 | 15 | 3 | | | | | | | | | | | 5 | 13 | 11 |
| | 14 | 10 | | | | | | | | | | 8 | 9 | 4 | 1 |
| | | 8 | 6 | | | | | | | | | 3 | 15 | | |
| | | | 9 | 2 | 6 | | 14 | 16 | | 13 | | 4 | | | |
| | 5 | 14 | 7 | 3 | 13 | 1 | 15 | 2 | 12 | 10 | 4 | 9 | 16 | | |
| | | | | 12 | 11 | | 9 | 15 | | 3 | 5 | | | | |
| | | | | | | | 4 | 11 | | | | | | | |

Michael Metcalf retired from CERN a long time ago and now lives in Berlin. His most recent book (with John Reid and Malcolm Cohen) is *Modern Fortran Explained* (2018 Oxford University Press), e-mail michaelmetcalf@compuserve.com