



THE PUZZLING SIDE OF CHESS

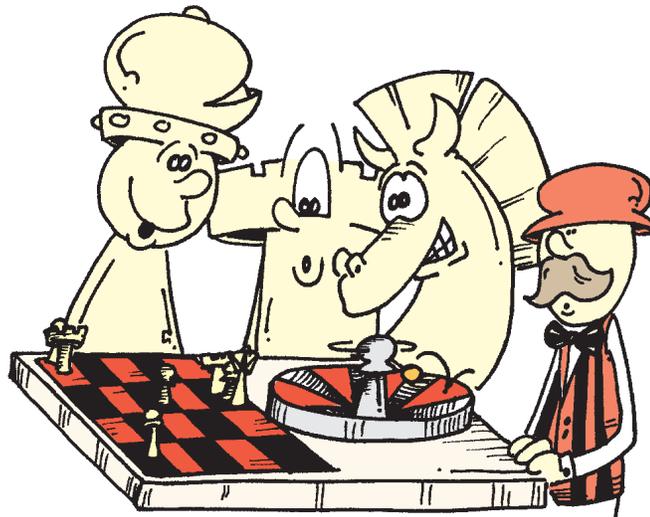
Jeff Coakley

CYCLOTRONS OF THE MILKY WAY

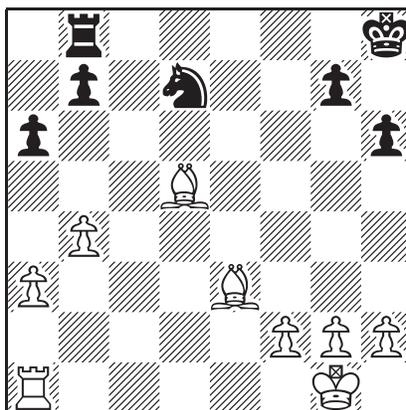
number 205

November 30, 2021

The fabric of the universe is cyclotronic. Circles within circles within circles. Everything cosmic, everything atomic, is spinning round. Like the pieces in these puzzles, nothing ever stands still.



Cyclotron 93



Cycle three pieces so that Black is in checkmate.
(See rules on next page.)

CYCLOTRONS

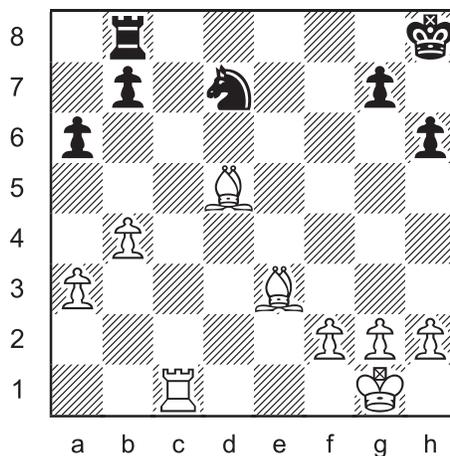
Switch the position of three pieces so that Black is in checkmate. No actual chess moves are made. The pieces simply swap squares. The pieces trade places in a "cycle". Piece A goes to square B, piece B goes to square C, and piece C goes to square A.

Any three pieces can trade places. Colours do not matter. The cycled pieces can be all white, all black, or a mix of both. Cycling the black king is a common trick.

The position after the cycle must be legal. For example, pawns cannot be on the 1st or 8th rank, nor can both kings be in check.



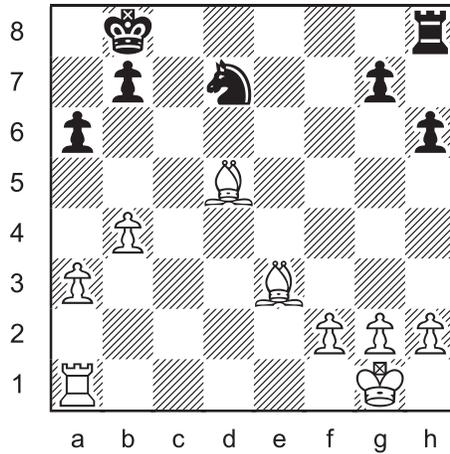
Cyclotron 94



Cycle three pieces so that Black is in checkmate.

By now you will have surmised that the six problems in this column are approximate twins. Each position has one or two differences, more than enough to change the solution.

Cyclotron 95



Cycle three pieces so that Black is in checkmate.

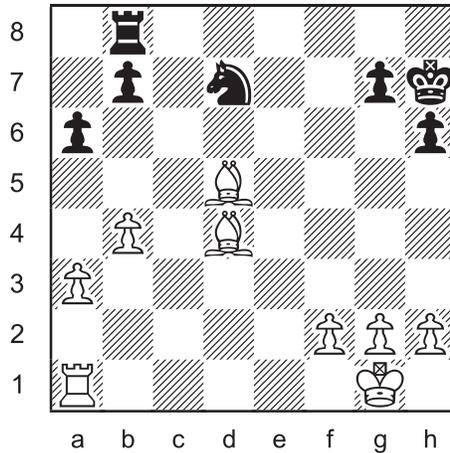


Milky Way

The Milky Way is a broad band of hazy white light arching across the midnight sky. Visible on clear nights away from city lights, the Milky Way has intrigued stargazers since ancient times.

It was not until 1610 that Galileo's telescope revealed that the Milky Way consists of countless stars indiscernible to the human eye.

Cyclotron 96



Cycle three pieces so that Black is in checkmate.

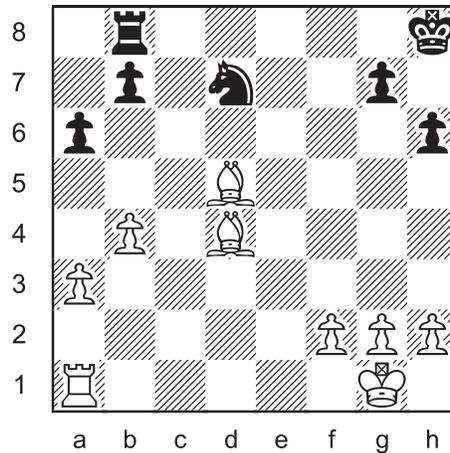


Milky Way Galaxy

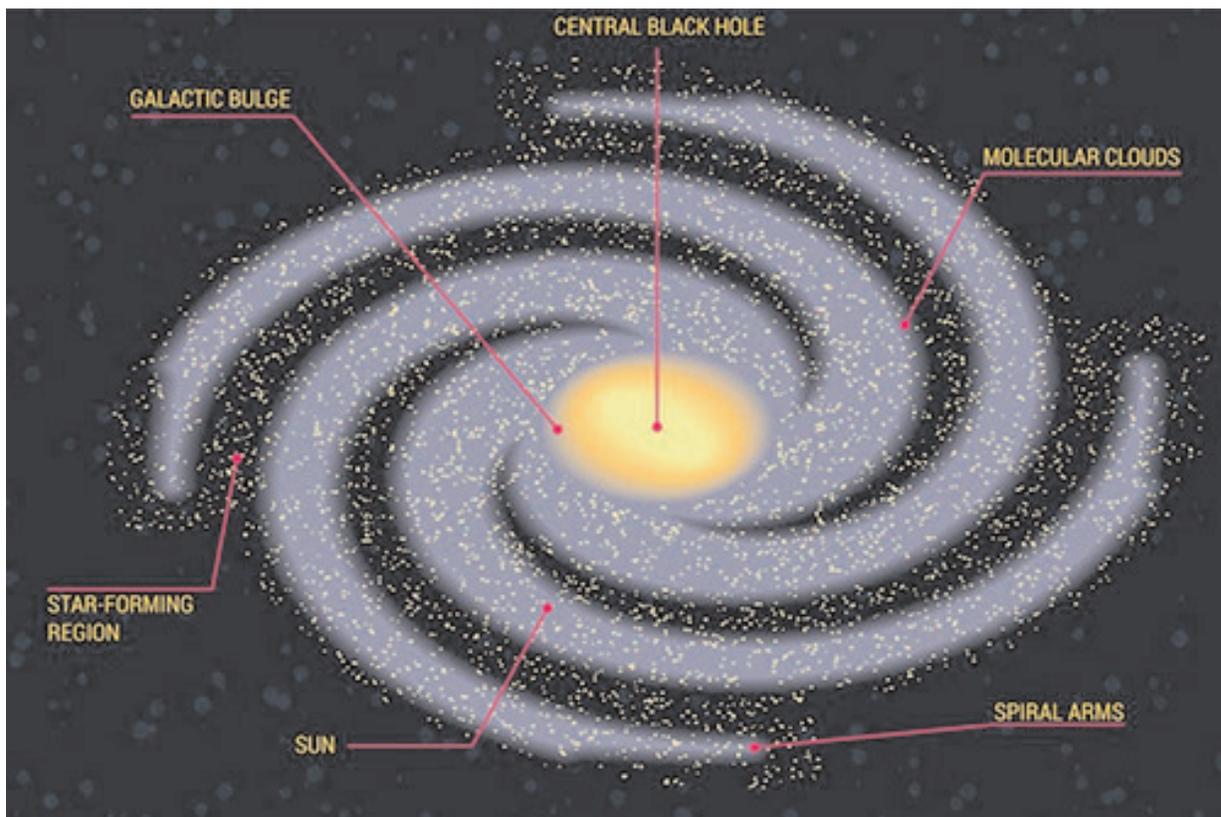
It was another century before astronomers realised the Milky Way is a galaxy of stars that includes our sun. Englishman Thomas Wright published a book in 1750 titled *An Original Theory or New Hypothesis of the Universe* in which he describes the Milky Way as “an optical effect due to our immersion in ... a flat layer of stars”.

Every star visible to the eye is part of the Milky Way. The band of light in our sky is what we see when we look towards the centre of the galaxy.

Cyclotron 97



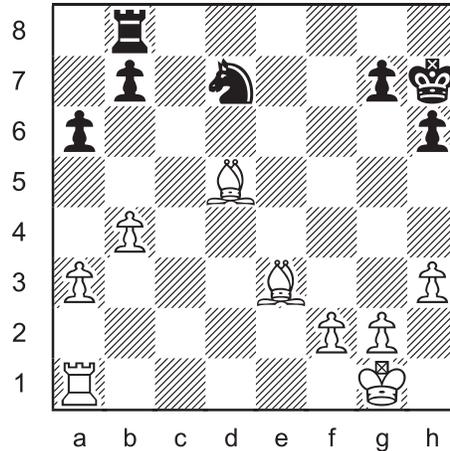
Cycle three pieces so that Black is in checkmate.



The Milky way is a *spiral galaxy* with more than 100 billion stars circling a supermassive black hole. Our sun is located in one of the spiralling arms called the Orion Spur, travelling around the galactic centre at 200 km/sec (500,000 mph). One orbit takes 240 million years.

The galaxy is 100,000 light-years across and 1000 light-years thick. (One light-year is 9.5 trillion kilometres.)

Cyclotron 98



Cycle three pieces so that Black is in checkmate.



Milky Way sideways

In 1924, observations by American astronomer Edwin Hubble proved the existence of other galaxies. Prior to that time, it was thought that the Milky Way was the entire universe. There are now estimated to be over 100 billion galaxies. And of course, they are not standing still.

Relative to the cosmic background, our galaxy is moving through space at 600 km/sec (1,340,000 mph). But it is not clear where the Milky Way is going! We are heading in the direction of a gigantic unseen mass called the Great Attractor, whose view from Earth is obscured by the galactic centre.

In the year 2525, ...

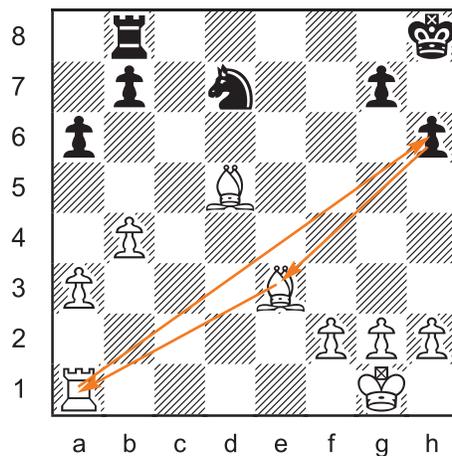
SOLUTIONS

All cyclotrons by J. Coakley. *Puzzling Side of Chess* (2021).

PDF hyperlinks. You can advance to the solution of any puzzle by clicking on the underlined title above the diagram. To return to the puzzle, click on the title above the solution diagram.

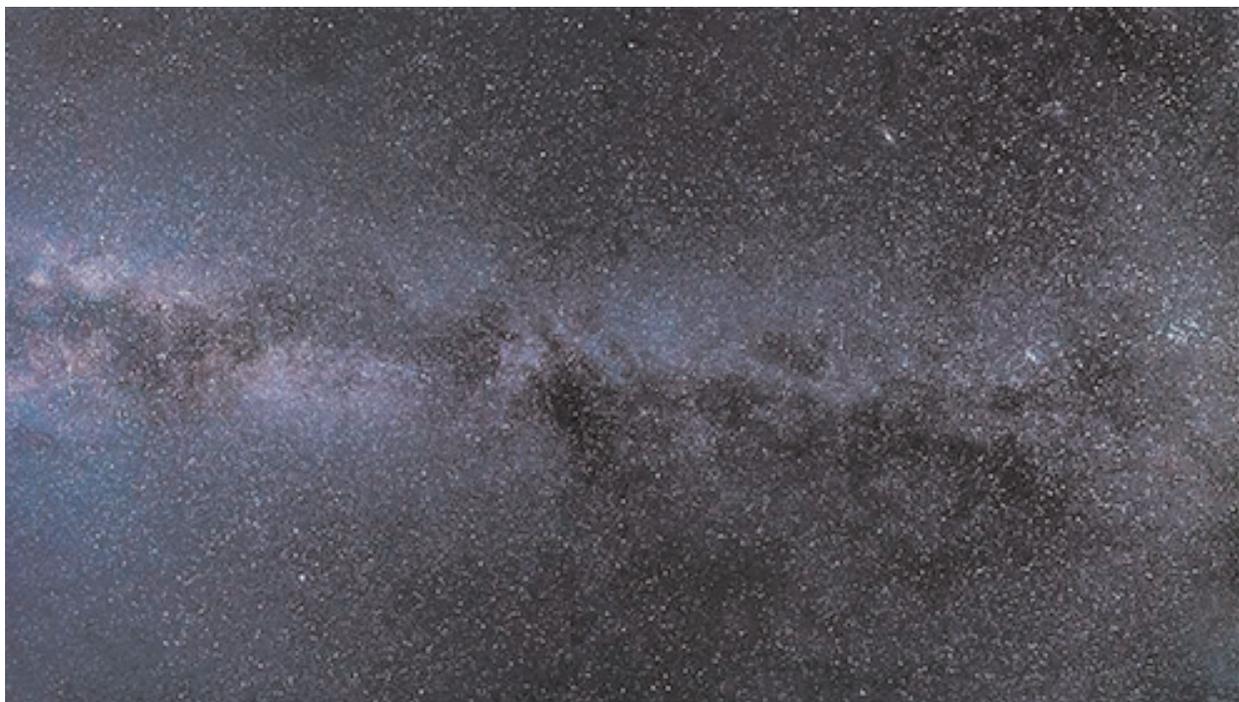
Archives. Past columns are available in the *Puzzling Side* archives. For more information on ordinary switcheroos, see column 4.

Cyclotron 93



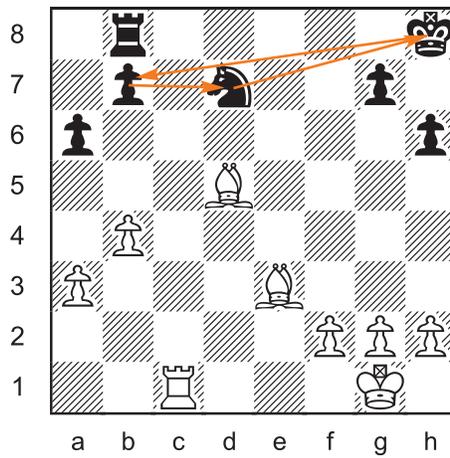
Ra1→h6 h6→Be3 Be3→a1

Bishop pin.

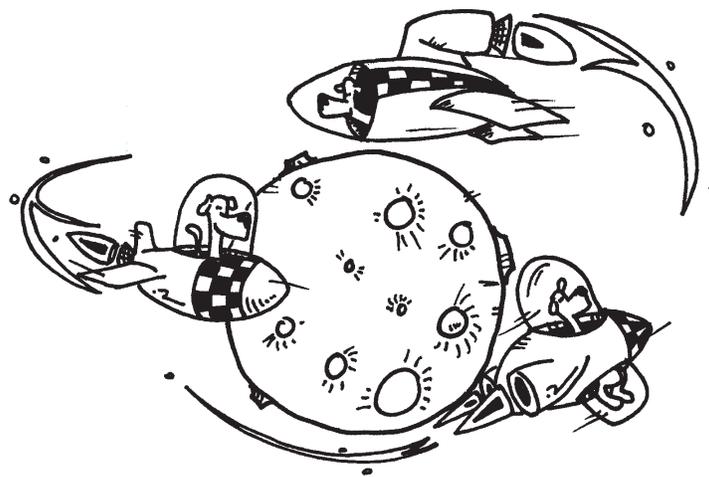


Milky Way

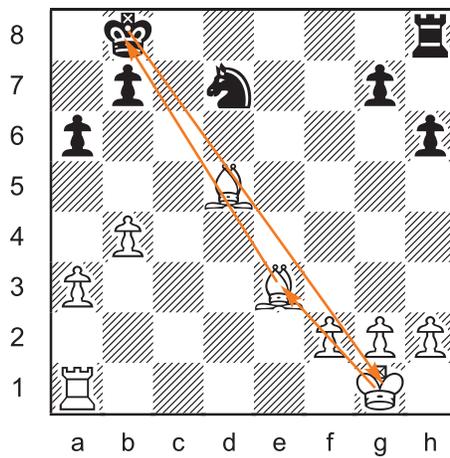
Cyclotron 94



b7→d7 Nd7→h8 Kh8→b7
Raking bishops.

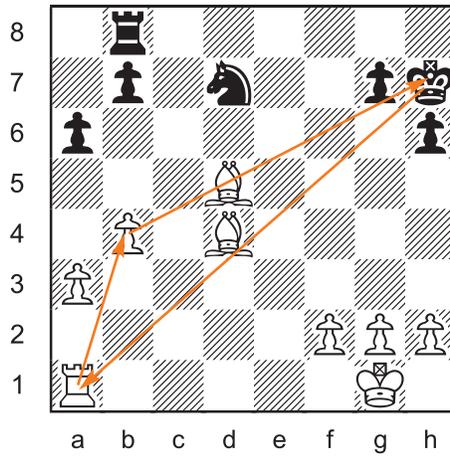


Cyclotron 95



Kb8→g1 Kg1→e3 Be3→b8
Cycled bishop protects h2.

Cyclotron 96



Ra1→b4 b4→h7 Kh7→a1

Cornered king.



Space: the Final Frontier

Based on data from the Kepler space telescope, scientists estimate that the galaxy contains over 40 billion habitable earth-size planets in orbit around sun-like stars. Strange new worlds!

