

A Choose to Read Ohio Toolkit

Use this toolkit to plan book discussions, library programs, or classroom activities.

Meet Ohio author Mary Kay Carson as she takes young readers on a tour beyond the local cosmic neighborhood.

Discover nonfiction websites and real world locations to explore topics and themes in depth.

Select from a range of discussion questions and extension activities to deepen the reading experience.

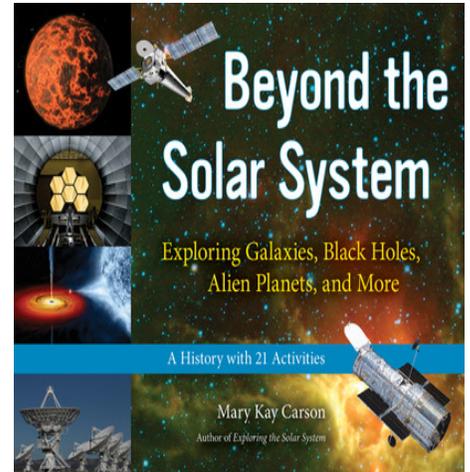
Beyond the Solar System

By Mary Kay Carson



About the Book

Humans have gazed into the night sky for thousands of years and wondered, what are those twinkling lights? Though the sun, moon, and planets moved across the background of stars, the stars appeared immovable, forever fixed in constellations. Only when astronomers began taking a closer look did anyone realize what a fascinating, ever-changing universe lies beyond our solar system—red giant and white dwarf stars, spiral galaxies, wispy nebulae, black holes, and much more. Mary Kay Carson traces the evolution of humankind's astronomical knowledge, from the realization that we are not at the center of the universe to recent telescopic proof of planets orbiting stars outside our solar system. 21 hands-on projects inspire readers to further explore the subjects discussed, from a three-dimensional representation of the constellation Orion to a reflecting telescope constructed from a makeup mirror and a magnifying glass.



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About the Author

Mary Kay Carson is an award-winning children's nonfiction author. She began her writing career working on the classroom magazine *SuperScience* at Scholastic in New York City and has been a full-time freelance writer for the past fifteen years. The author has written more than thirty books for young people about wildlife, space, weather, nature, and history. Her recent nonfiction titles include ***The Bat Scientists***; ***Emi and the Rhino Scientist***, about the Cincinnati Zoo's famous rhino mom; ***Exploring the Solar System***, recipient of the 2009 American Institute of Aeronautics and Astronautics Children's Literature Award; ***The Wright Brothers for Kids***; ***Inside Tornadoes***; and the *Far-Out Guide to the Solar System* series. The author also gives presentations at schools and libraries about space, animals, history, and writing. Mary Kay and her photographer husband Tom Uhlman live in Cincinnati's Northside neighborhood with their dog, Ruby.



Author Resources

Mary Kay Carson's Official Website

<http://www.marykaycarson.com>

Author Page on Chicago Review Press Website

<http://www.chicagoreviewpress.com/carson--mary-kay-contributor-187651.php>

Mary Kay Carson's Blog: HANDS-ON-BOOKS: Nonfiction for Kids with Fun Activities

<http://hands-on-books.blogspot.com/>

A joint blog by authors Mary Kay Carson, Brandon Marie Miller, and Kerrie Hollihan.

Video: Mary Kay Carson discusses her books

<https://www.youtube.com/watch?v=-6LqJVw8Hc>

In conjunction with the 2014 Ohio Educational Library Media Association (OELMA) conference, Carson introduces several of her books, and shares how her experiences growing up in southwestern Ohio and her love of nature led to her becoming a writer.

For publicity and speaking engagement inquiries:

Contact Mary Kay Carson at mk@fuse.net. She is available to give presentations at schools, libraries, clubs, and other organizations. All programs are tailored to meet the specific needs and preferences of the audience and its organizers. For more information, see http://www.marykaycarson.com/Author_Visits.html.

Book Details

Beyond the Solar System: Exploring Galaxies, Black Holes, Alien Planets, and More

by Mary Kay Carson.

Chicago Review Press, 2013. ISBN 9781613745441. Ages 9-up. 980L Lexile.

<http://www.chicagoreviewpress.com/>

Available as an ebook through the Ohio Digital Library: <http://ohdbks.lib.overdrive.com>

Talk about it!

Topics to share when discussing ***Beyond the Solar System*** with young readers.

Educators: Every CTRO book may be used to support Ohio's New Learning Standards (Common Core) English Language Arts reading, writing, and speaking and listening standards. Examples are listed below; other standards also apply. ***Beyond the Solar System*** may also support standards in Science (Earth and Space-cycles and patterns in the Solar System,) and Social Studies (Historical Thinking Skills).

Librarians, parents, and others: These discussion questions are also for library programs, family activities, and other projects. Learning Standards define what students should know and be able to do at each grade. They are included for teachers who want to use this book in school. For more information, see the Ohio Dept. of Education website, <http://education.ohio.gov>. Click on "Ohio's New Learning Standards" in the Teacher Resources section.

Explore different aspects of space exploration. For example, examine the changes to telescopes over the years. How have telescopes improved over the years? (RI.4-6.1)

Exploring the cosmos was not an inexpensive venture. Examine the role church clergy and wealthy individuals played in funding this research. What were some of the problems scientists experienced because of inadequate resources? How did this dependency affect the quality of information produced by these scientists? (RI.4-6.8)

Talk About it! (continued)

Expressing your beliefs could be dangerous for a scientist. Using two or more texts, research Galileo's and Johannes Kepler's different approaches to informing the public of new scientific discoveries. What were some of the dangers scientists faced? What role did courage play in scientists expressing their beliefs? (RI.4-5.9)

Women have played a lesser-known role in astronomy. Discuss some of the women involved in the field. What barriers did women have to overcome to have their research accepted? What role did education play in a woman's ability to conduct scientific research? (SL.4-6.1)

Scientists build on the discoveries and inventions of earlier scientists. Pick a modern astronomer. How did this astronomer use the discoveries and/or inventions of earlier scientists? (RI.4-6.3)

Early astronomers observed the cosmos in relative safety. Discuss the role astronauts have played in building on the work of earlier generations of earthbound scientists. Research Ohioan John Glenn's journeys into space. Present a summary of the dangers John Glenn faced during his space flights. (SL.4-6.4)

Based on individual or group research into topics in astronomy, discuss some reasons young people may aspire to become astronomers. (SL.4-6.1)

Go Further!

*Ideas for extending the experience of reading **Beyond the Solar System**.*

Start with the 21 hands-on activities included in the book. Readers may model the warping of space-time caused by a black hole, inflate a balloon to see how the universe expands, and construct a reflecting telescope out of a makeup mirror and a magnifying glass. The full list of projects includes:

1. Find Polaris, the North Star (no equipment needed!)
2. Model Ptolemy's view of the universe
3. Make an Astrolabe to measure the angles of space objects
4. Star-watch
5. Observe the sky without and with binoculars
6. Make a reflecting telescope
7. Split white light
8. Make a 3-D starscape
9. Construct a model to explore two views of the Milky Way
10. Make sky measurements using just your hand
11. Demonstrate general relativity using a t-shirt
12. Make a toy that demonstrates the equivalence of gravity and acceleration
13. Model how a planet affects space-time
14. Use a balloon to model the expanding universe
15. Construct a radio frequency interference detector
16. Make a radio picture
17. Model a pulsar using a flashlight
18. Model a black hole using a can and a balloon
19. Create a 3-D map out of bubbles to understand galaxy clusters
20. Map the group of galaxies that includes the Milky Way
21. Create a model to demonstrate how exoplanets are identified

Beyond the Solar System also includes a list of astronomy websites to explore and resources for sky watching (p. 121). NASA's **Space Place** (<http://spaceplace.nasa.gov/>) offers science demonstrations and other hands-on projects, interactive games and quizzes, and facts about space science and technology for elementary school students.

Explore more!

Additional ideas and resources to use with ***Beyond the Solar System***.

Read ***Exploring the Solar System*** by Mary Kay Carlson. (ISBN 9781556527159). In this book, kids delve into the rich history of space exploration, where telescopes, satellites, probes, landers, and human missions lead to amazing discoveries. Updated to include the recent discovery of Eris which, along with Pluto, has been newly classified as a "dwarf planet," this cosmic adventure challenges kids to explore the planets and other celestial bodies for themselves through activities such as building a model of a comet using soil, molasses, dry ice, and window cleaner; or creating their own reentry vehicle to safely return an egg to Earth's surface. The book also includes biographies of more than 20 space pioneers, specific mission details, a 20-page field guide to the solar system, and plenty of suggestions for further research.

Ohio offers many resources for young astronomers. Organize a field trip to your local observatory or planetarium, or participate in a stargazing program at a Metro Park.

Find an observatory in your area:

<http://observatoriesofohio.org/>

Find a planetarium in your area:

<http://www.go-astronomy.com/planetariums-state.php?State=OH>

Ohio's many science museums provide opportunities for astronomical exploration. Several museums have a specific astronomy focus, including:

Armstrong Air and Space Museum (Wapakoneta)

<http://www.armstrongmuseum.org/>

Drake Planetarium and Science Center (Cincinnati)

<http://www.drakeplanetarium.org/>

International Women's Air & Space Museum (Cleveland)

<http://iwasm.org/>

NASA Glenn Research Center

<http://www.nasa.gov/centers/glenn/home/>

The National Aeronautics and Space Administration (NASA) Glenn Research Center in Cleveland researches, designs, develops and tests innovative technology for aeronautics and spaceflight. Glenn offers tours, traveling exhibits, and a speakers' bureau.

Choose to Read Ohio, a project of the State Library of Ohio the Ohioana Library Association, and the Ohio Center for the Book, encourages public libraries, schools, families, and others to build a community of readers and an appreciation of Ohio authors and literature. CTRO is adaptable for use in classrooms, libraries, bookstores, by book discussion groups, families, and other community groups.

Explore Choose to Read Ohio resources & toolkits:

<http://library.ohio.gov/ctro>.

This toolkit revised
June 2015.

STATE LIBRARY OF OHIO



274 East First Avenue, Columbus, Ohio 43201-3692
(614) 644-6910 • www.library.ohio.gov