

FAST Telescope

Marty Gitlin



Mitchell Lane

PUBLISHERS

2001 SW 31st Avenue
Hallandale, FL 33009
www.mitchelllane.com

Mitchell Lane

PUBLISHERS

Copyright © 2018 by Mitchell Lane Publishers. All rights reserved. No part of this book may be reproduced without written permission from the publisher. Printed and bound in the United States of America.

Printing 1 2 3 4 5 6 7 8



Designer: Sharon Beck

Editor: Jim Whiting

Library of Congress Cataloging-in-Publication Data

Names: Gitlin, Marty, author.

Title: The FAST telescope / by Marty Gitlin.

Description: Hallandale, FL : Mitchell Lane Publishers, [2018] | Series: Engineering feats | FAST stands for Five-hundred-meter Aperture Spherical Telescope. | Audience: Grades 4 to 6. | Includes bibliographical references and index.

Identifiers: LCCN 2017046722 | ISBN 9781680201642 (library bound)

Subjects: LCSH: Radio telescopes—Juvenile literature. | Radio telescopes—China—Juvenile literature. | Radio astronomy—Juvenile literature. | Very long baseline interferometry—Juvenile literature. | CYAC: Telescopes.

Classification: LCC QB479.2 .G58 2018 | DDC 522/.682—dc23

LC record available at <https://lccn.loc.gov/2017046722>

eBook ISBN: 9-781-6802-0165-9

PHOTO CREDITS: Design elements—RED_SPY/Getty Images, Ifness/Getty Images, Madmaxer/Getty Images, chictype/Getty Images, Thissatan/Getty Images, Nongkran_ch/Getty Images. Back cover photos (left to right)—NASA/JPL, Imagine China/Newscom, Henryk Sadura/Getty Images, NASA, Rehman/cc by-sa 2.0, U.S. Navy/Mass Communication Specialist Seaman Casey Hopkins/Public domain. Cover, pp. 1, 14-15, 16, 19—Imagine China/Newscom; pp. 5, 8, 20-21—Jin Liwang/Alamy Live News/Xinhua/Alamy Stock Photo; p. 6—Mysid/Jm smits/GDFL/cc-by-sa 3.0; p. 7—Yinweichen/cc-by-sa 3.0; pp. 9, 24, 25, 30—Ou Dongqu/Xinhua/Alamy Live News/Alamy Stock Photo; p. 11—Qu Zhendong/Xinhua/Alamy Stock Photo; p. 13—Photograph by Mike Peel (www.mikepeel.net)/cc-by-sa 4.0; p. 22—VCG/VCG via Getty Images/VCG/Stringer/Getty Images News; p. 23—Imaginechina/Splash News/Newscom; p. 26—Mike Peel; Jodrell Bank Centre for Astrophysics, University of Manchester/Creative Commons CC-BY-SA 2.0-UK, 2.5, 4.0; p. 27—NASA and The Hubble Heritage Team (STScI)/Public domain; p. 29—LAURENCE CHU, GAL ROMA AFP/Newscom; p. 31—Photo by CEphoto, Uwe Aranas/CC-BY-SA-3.0; p. 32—Alamy Live News/Xinhua/Alamy Stock Photo; p. 33—<http://www.scienceimage.csiro.au/pages/about/CSIRO/cc-by-sa 3.0>; p. 35—(WT-shared) Jpatokal at [wts wikivoyage](https://www.wikivoyage.org/wiki/WT-shared)/cc-by-sa 4.0, (inset) Jeff Hitchcock/cc-by-sa 2.0; pp. 36-37—SKA Project Development Office and Swinburne Astronomy Productions/cc-by-sa 3.0; p. 37 (inset)—McComas/MCT/Newscom; p. 39—Robert Burch/Alamy Stock Photo.

CONTENTS

CHAPTER 1

Big Hope for a Big Telescope 4

CHAPTER 2

Birth of a Marvel 12

CHAPTER 3

Bigger and Stronger 18

CHAPTER 4

The Amazing Attraction..... 28

CHAPTER 5

An Incredible Feat..... 34

What You Should Know 40

Quick Stats..... 40

Timeline 41

Chapter Notes 42

Further Reading 44

Works Consulted..... 44

On the Internet..... 45

Glossary 46

Index 47

About the Author..... 48

Words in **bold** throughout can be found in the Glossary.

1

Big Hope for a Big Telescope

The universe is a mystery. There are a million questions for every answer. And one question has seemingly been asked more than any other: Is there life on other planets?

Nobody knows for sure. Experts believe it is probable. At least 200 billion **galaxies** exist and each one of them has many planets. So how likely is it that Earth is the only one with living beings? Not very.

Yet there is no proof. The truth remains unknown. For centuries, scientists have been unable to find out. But just maybe they will now.

The date was September 25, 2016, in the remote Guizhou Province of southeast China. That is when the FAST telescope first opened its eyes. That is when the marvel of engineering started studying the universe. That is when it began detecting images and sounds beyond what anyone had ever been seen or heard.

Its full name is the Five-Hundred-Meter **Aperture** Spherical Telescope. It is the world's largest radio telescope. According to the National Radio **Astronomy** Observatory, "Radio telescopes collect weak radio light waves, bring them to a focus, amplify them and make them available for analysis. . . . Naturally occurring radio waves are extremely weak by the time they reach us from space. A cell phone signal is a billion billion times more powerful than the cosmic waves our telescopes detect."¹

Its field of vision is more than twice that of anything built before it. Its gigantic dish is 500 meters (1,640 feet) in diameter. Its area is

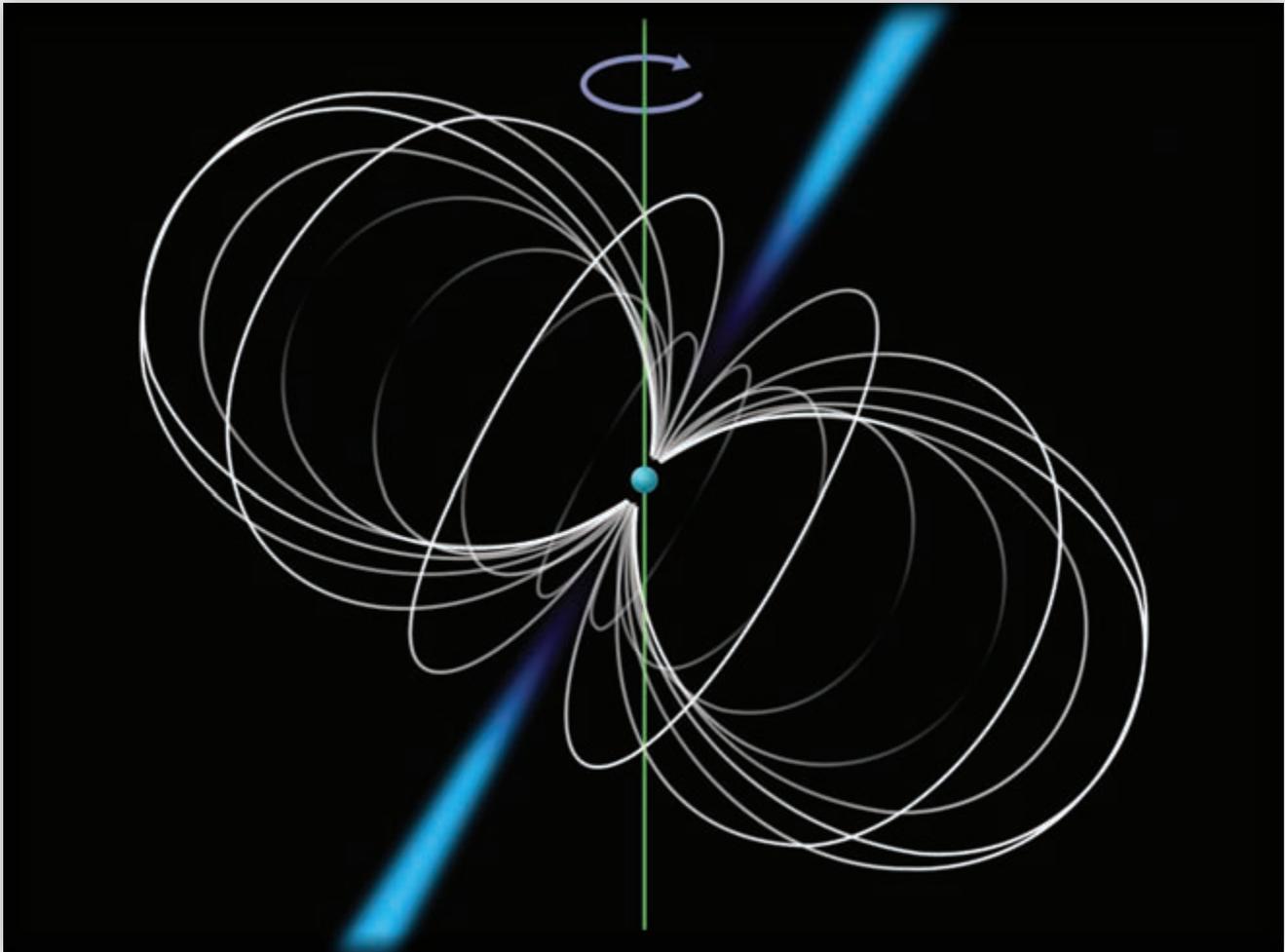


The enormity of the FAST Telescope, which is 500 meters in diameter, is shown in this aerial shot. The photo was taken the day before the structure was completed and put into use.

CHAPTER 1

the same size as 30 soccer fields. A total of 4,450 panels receive signals from billions of miles away in space.

The new marvel works to hear signals from distant galaxies. It will help store the memory of radio waves known as **pulsars**. It will probe **gravitational waves**. It will seek out dark matter. That is previously unexplored space that makes up most of the universe.²

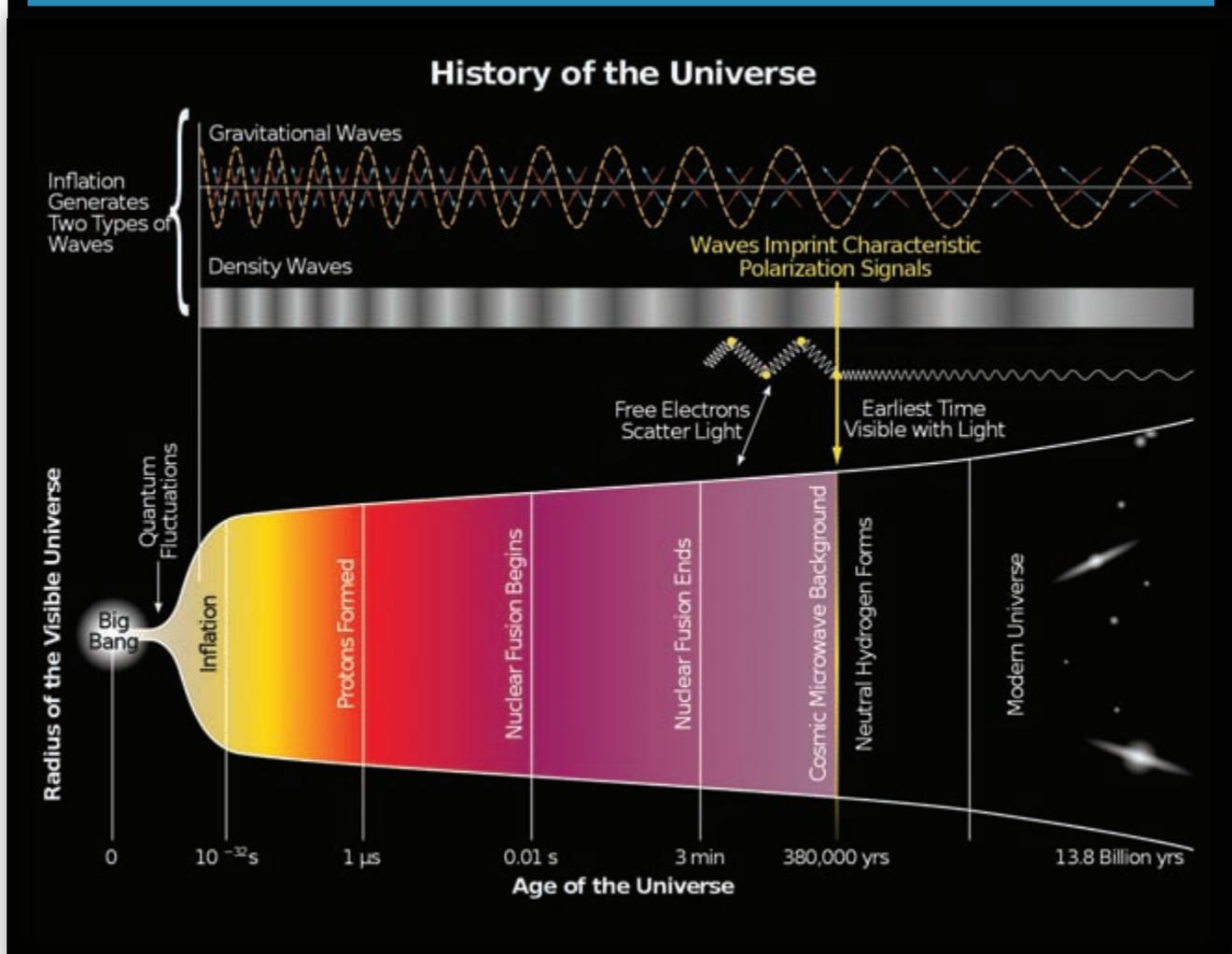


Schematic view of a pulsar. It is centered on a neutron star, the dot in the center. A neutron star is what remains of a dying star. It is only about 10 miles in diameter and so dense that a teaspoon of matter weighs a billion tons. As it quickly rotates on its axis (the vertical green line), it produces an incredibly strong magnetic field (the white circles). This magnetic field greatly accelerates particles to produce radio waves (the two blue lines). FAST and other radio telescopes seek to detect these radio waves.

Most important, it will listen for signals from alien beings. Three potentially life-friendly planets were recently discovered outside our solar system. That has sparked interest again in whether intelligent life exists elsewhere.³

FAST FACT

Scientists now know the universe is growing. But what is it growing into? Does it have an edge? Is there something beyond the known universe? Nobody knows for sure. But attempts have been made to find out if the universe is a sphere. Scientists believe it might curve back on itself. That means someone traveling in one direction would eventually return to the starting point.⁴



You've Just Finished your Free Sample

Enjoyed the preview?

Buy: <http://www.ebooks2go.com>