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## Galileo Galilei: Science and Scripture in Conflict? (Participant's Guide)

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Participant's Guide to

# Galileo Galilei: Science and Scripture in Conflict?

*A Study of Galileo's Daughter: A Historical Memoir of Science, Faith, and Love*

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## How to Use This Material?

This study of Galileo Galilei's experience with the relationship between Christianity and his science, as presented in Dava Sobel's *Galileo's Daughter*, is composed of seven sections that each contain a set of *Reading and Reflection* questions. *Reading and Reflection* questions are to be completed before each meeting and are meant to help the participant wrestle with the concepts introduced in that week's chapters. Your groups should by no means limit itself to the questions contained in these sections.

This study is intended for **informal, small group** discussion, such as that of a Bible study, catechism, or family reunion. Each theme may be unpacked on its own, but it is the hope of the authors that the entire study may be useful to the interested reader (leader and participant alike). The study is also aimed toward **high school students, college students, and post-college adults** with an interest in how science and the Christian faith interact.

As you read, it is our hope that you will come across (and come up with) questions which challenge you, both in understanding your personal faith and in understanding science. In these questions, you will have the opportunity to grow through asking and answering these questions in a healthy setting. Consider the context and history of these questions: Why has the church historically believed in *this* answer or *that* answer? What might you say if you were a Christian scientist? How might you be challenged to defend your answer?

## Who is the author of *Galileo's Daughter*?

Dava Sobel, a former *New York Times* science reporter, is the author of *Longitude*, *Galileo's Daughter*, *The Planets*, *A More Perfect Heaven*, *And the Sun Stood Still*, and *The Glass Universe*. A longtime science contributor to *Harvard Magazine*, *Audubon*, *Discover*, *Life*, *Omni*, and *The New Yorker*, she received the 2001 Individual Public Service Award from the National Science Board "for fostering awareness of science and technology among broad segments of the general public." Also in 2001, the Boston Museum of Science gave her its prestigious Bradford Washburn Award for her "outstanding contribution toward public understanding of science, appreciation of its fascination, and the vital roles it plays in all our lives." Her 2014 Cultural Award from Eduard Rhein Foundation in Germany commends her "for using her profound scientific knowledge and literary talent to combine facts with fiction by merging scientific adventures and human stories in order to give the history of science a human face."

A 1964 graduate of the Bronx High School of Science, Ms. Sobel attended Antioch College and the City College of New York before receiving her bachelor of arts degree from the State University of New York at Binghamton in 1969. She holds honorary doctor of letters degrees from the University of Bath, in England, and Middlebury College, Vermont, both awarded in 2002, and also an honorary doctor of science degree from the University of Bern, Switzerland, 2015.

She based her book *Galileo's Daughter* on 124 surviving letters to Galileo from his eldest child. Ms. Sobel translated the letters from the original Italian and used them to elucidate the great scientist's life work. *Galileo's Daughter* won the 1999 Los Angeles Times Book Prize for science and technology, a 2000 Christopher Award, and was a finalist for the 2000 Pulitzer Prize in biography. The paperback edition enjoyed five consecutive weeks as the #1 New York Times nonfiction bestseller. A two-hour "NOVA" documentary inspired by *Galileo's Daughter*, called "Galileo's Battle for the Heavens," aired on public television in 2002 and won an Emmy in the category of historical programming.

For those interested, more of her biography and background can be found on her website at <http://www.davasobel.com/about-dava-sobel/>.

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## Part One: To Florence

### Reading and Reflection Questions

Sobel, pp. 3-95

I. When did Virginia become Maria Celeste? Why did she choose this name?

II. How did Vincenzo Galilei (Galileo's father) influence Galileo Galilei's mathematical pursuits? Why, do you think, is Galileo called "the father of experimental physics"?

III. Did Galileo invent "the spyglass, or eyeglass"? What was his first 'planetary' discovery with the new telescope (or rather, his first four planetary discoveries)?

IV. How was Galileo received in Rome when he traveled there to publicize his discoveries? In which three significant ways did *Bodies in Water* upset academic tradition (47)?

V. Explain the heliocentric rationale of Polish cleric Nicholas Copernicus. Which Aristotelian law did the "nova" challenge?

VI. Why did Galileo write *Letter to Grand Duchess Cristina*?

VII. At which "anxious moment in Church history" was Galileo's *Letters* written? Why was the Copernican system deemed "formally heretical"?

VIII. Why did Galileo "resist the temptation to go outdoors in the autumn of 1618 long enough to view any one of the three comets"? What do you think about the spirit and intensity of Galileo's defensive writings in the rest of the chapter?

#### Works Written/Published During This Time

*The Starry Messenger* (1610)

*Discourse on Bodies That Stay Atop Water or Move Within It* (1612)

*Sunspot Letters* (1613)

*Letter to Grand Duchess Cristina* (written 1615, unpublished until 1636)

"Treatise [or Discourse] on the Tides" (written 1616, unpublished)

*Discourse on the Comets* (1619)

*The Assayer* (completed in 1622, unpublished until 1623)

#### Terms

**amanuensis** a literary or artistic assistant, in particular one who takes dictation or copies manuscripts

**discourse** a formal discussion of a topic in speech or writing

**treatise** a written work dealing formally and systematically with a subject

(en.oxforddictionaries.com)

## Part Two: On Bellosguardo

### Reading and Reflection Questions

Sobel, pp. 99-183

IX. How was the election of a new pope, Pope Urban VIII, significant for Galileo's scientific pursuits? What do you think of Galileo's parable about "the song of the cicada"?

X. How did Galileo respond when asked why he didn't simply hire someone to take over his manual labor (114)?

XI. What was the request of Maria Celeste (127)?

XII. What distinction did the Pope (and then-cardinal) draw between absolute and hypothetical truth (138)? Why do you think he found it necessary to make this distinction?

XIII. Who were the three main characters of Galileo's *Dialogue* and how does Sobel describe each? What had "prolific Italian theologian Saint Thomas Aquinas" done with the writings of Aristotle and early Christian doctrine (152)?



XIV. What do you think about the questions addressed on p. 154 by the *Dialogue* characters? Would you have been able to answer these questions before reading this biography? Can you answer them now?

XV. Does current science embrace the possibility of an infinite universe? Why or why not?

XVI. Why does Galileo refuse to endorse Copernicus in the end of the *Dialogue* (177)?

#### Works Written/Published During This Time

"Reply to Ingoli" (1624)

*Dialogue on the Tides* (completed 1629, unpublished until 1632 [with a different title])

## Part Three: In Rome

### Reading and Reflection Questions

Sobel, pp. 187-227

XVII. Which cause does Sobel name for the Thirty Years' War that "pertained to issues of religious faith" (192)? Why did Galileo rush to leave the city of Rome before undertaking the *Dialogue* corrections commanded by Urban VIII?

XVIII. Where does the word *quarantine* come from?

XIX. Why did Galileo decide to move to Arcetri?

XX. What were the two demands of the official order which reached the inquisitor at Florence concerning the *Dialogue* (225)?

### Works Written/Published During This Time

*Dialogue concerning the two Chief Systems of the World, Ptolemaic and Copernican* (1632)

Excerpts of *Two New Sciences* (see pg. 333)

### Terms

**confrere** a fellow member of a profession, a colleague

**peroration** the concluding part of a speech, typically intended to inspire enthusiasm in the audience

(en.oxforddictionaries.com)

## Part Four: In Care of the Tuscan Embassy, Villa Medici, Rome

### Reading and Reflection Questions

Sobel, pp. 231-281

XXI. On pg. 232, Sobel writes: "There was only one trial of Galileo, and yet it seems there were a thousand—the suppression of science by religion, the defense of individualism against authority, the clash between revolutionary and establishment, the challenge of radical new discoveries to ancient beliefs, the struggle against intolerance for freedom of thought and freedom of speech." Why do you think this trial was so important, immortalized in the annals of history even to the present day? What did you know about the trial before reading this biography?

XXII. Did Galileo lie under oath (253)? What do you think?

XXIII. What did Galileo name as his error? What is your response to his statement?

XXIV. Why, according to Galileo, did he write the published *Dialogue* (271)?

XXV. What was the result of the trial? What were the two commands issued by the Pope concerning the *Dialogue* and its author (see also pp. 310-311)?

Terms

**contrition** the state of feeling remorseful and penitent

**penitent** feeling or showing sorrow and regret for having done wrong; repentant

(en.oxforddictionaries.com)

## Part Five: At Siena

### Reading and Reflection Questions

Sobel, pp. 285-327

XXVI. What does Sobel have to say about reducing the case to one of science versus religion? What do you think: Did the Church condemn Galileo?

XXVII. Why had Aristotle ruled out any mathematical approach to physics (301)? Why did Galileo disagree?

XXVIII. How does the style of *Two New Sciences* differ from that of Galileo's earlier *Dialogue* (at least according to Sobel)?

XXIX. Why is Galileo considered the "father of modern physics" or the "father of modern science" (326)?

### Works Written During This Time

*Two New Sciences* [*Discourses and Mathematical Demonstrations Concerning Two New Sciences*] (unpublished until 1638)

## Part Six: From Arcetri

### Reading and Reflection Questions

Sobel, pp. 331-368

XXX. What is remarkable about how Galileo arrived at the fundamental relationship between distance and time (334)? What set Galileo "apart from most philosophers of his time" (337)?

XXXI. What tragic event interrupted Galileo's work on *Two New Sciences*, after which "For months he sought his only solace in reading religious poems and dialogues" (345)?

XXXII. Where was *Two New Sciences* finally published? What other loss did Galileo suffer in 1638 (354)?

XXXIII. What surprising find was made when Galileo's monument was finally completed and his grave relocated in 1703?

### Works Written/Published During This Time

*Discourses and Mathematical Demonstrations Concerning Two New Sciences* (1638)

## Final Thoughts

1. How did you see Galileo faithfully and unfaithfully carrying out his God-given role (calling) in the biography?

2. How did the conflict between science and the Roman Catholic Church impact the relations between science and religion? How did Galileo affect the scientific community of his time and afterwards?

3. What was Galileo's impact on the church? Do you think it was his intention to have such an impact?

4. What issues do you see today that call on the church for a response? What should the church's response be? Why?

5. What do you see as the role of religion in our lives? What do you see as the role of science in our lives? What do you think the relationship between religion and science ought to be?

## Bibliography

Sobel, Dava. *Galileo's Daughter: a Historical Memoir of Science, Faith, and Love*.  
New York: Walker & Co., 1999. Print.