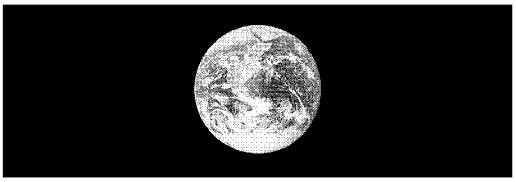
Astronomy 141:

Life in the Universe



Wednesday, September 22

Professor Barbara Ryden

The Professor:
Barbara Ryden

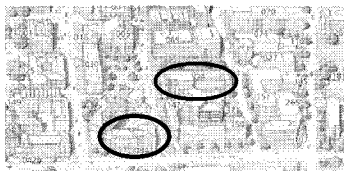
B.A. Northwestern ('83)

Ph.D. Princeton ('87)

Postdoctoral fellowships at Harvard-Smithsonian Center for Astrophysics, Canadian Institute for Theoretical Astrophysics

Currently an associate professor in the department of astronomy at OSU

Office hours:
4035 McPherson Laboratory



North→

Office hours:
Mo Fr 9 – 11 am, Tu We 3:30 – 5:30 pm,
or by appointment [phone 292-4562]

Graduate Teaching Associate:

Courtney Epstein

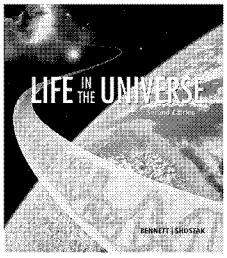
Office: 4020 McPherson

Office hours: Mo Th Fr 11 – 12:30

Instructional Assistant:

Will Mutters

Textbook:



Life in the Universe *(2nd edition)*
by Bennett & Shostak

Course Website:

www.astronomy.ohio-state.edu/~ryden/ast141/

Contains: Lecture PowerPoint printouts, syllabus, problem sets, & useful links.

This course will not use Carmen.

Four In-Class Quizzes

Quizzes will be closed-book, closed-notes, multiple-choice exams.
Each quiz will cover material since the previous quiz.
Each quiz will count for 10% of your course grade: 40% total.

Friday, October 8; Friday, October 22; Friday, November 5; Friday, November 19

Four Take-home Problem Sets

Problem sets will be open-book, open-notes, open-internet homework.
Problem sets will typically contain 5 short-answer problems.
Each problem set will count for 7.5% of your course grade: 30% total.

due Monday, October 18; Monday, November 1; Monday, November 15; Monday, November 29

Final Exam

Cumulative, closed-book, closed-notes, multiple-choice exam.
Counts for 30% of your course grade.

Tuesday, December 7, 1:30 pm

You are about to study **astrobiology**.

Astrobiology is the science that studies life everywhere in the universe (not just on Earth).

What is Science?

Systematic study of the universe, using the **scientific method.**

Scientific Method

Gather facts

↓

Guess an explanation (guess = "hypothesis")

↓

Test hypothesis

↓

Modify hypothesis ↺

A well-tested hypothesis = "theory"

The Big Question: Are we alone?

Does (intelligent) life exist elsewhere in the universe?

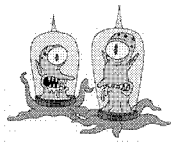
Related questions:

- Is there life on other planets (or moons) in our Solar System?
- Are there planetary systems around stars other than the Sun?
- Do some of these systems have planets like the Earth?
- Has life arisen on any of these planets?

People have long speculated about life elsewhere in the universe.

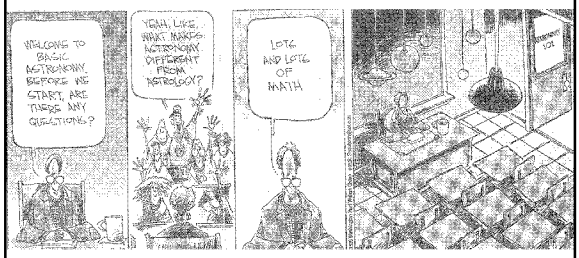
War of the Worlds 1898

E.T. 1982



The Simpsons 1990 -

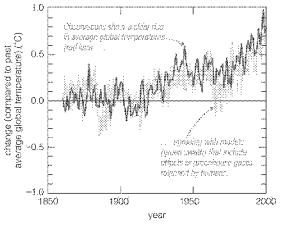
Scientists prefer quantitative analysis, based on verifiable observations and measurements.



What math do you need?
A little algebra, and the ability to read a graph.

$$F = G\frac{M_1 M_2}{d^2}$$

$$P^2 = a^3$$



Tomorrow's Lecture:

Astronomical Numbers

This week's reading:

Chapter 1