

Chapter 9

Equations for energy and light

Parts of a wave (all parts and be able to describe and draw them)

Choosing a wavelength for communication

Types of noise

What other ways are there to send info than radio waves?

What were the different choices of radio frequency (know the order)

What is the “water hole”

Radio techniques

Describe how radio waves are captured

What do you want to use a dish rather than an antenna?

What is the largest single radio telescope? What is its size?

Discuss difference between analog vs. digital (advantage of digital)

Difference between amplitude and frequency (how they work, examples of each)

Recognizing and decoding the message

Different objects observed

Pulsars

Masers

Cryptography vs. antecryptography

Identify the different parts in the picture sent by Drake and Sagan

Past and Future searches

Leakage radiation from earth (when? what?)

Television transmission (pros and cons)

Defense radars (pros and cons)

How far has out leakage radiation traveled?

How many stars has it reached for strong and weak signals?

Problems in finding signal

Where and when to listen

What frequency to use

What polarization

How signal is coded

Assume we know all but where to look and what frequency

Have to look in many directions

Know about sensitivity (equation?), how it changes, good vs. bad sensitivity

Know picture of dish (pg 149)

What is the “trade off” (know observations, time, range of direction, sensitivity, diameter, etc.

Observing strong vs. weak signals

Know diagram of spectrum analyzer (pg 150)

Discuss the trade-off between frequencies (bandwidth vs. frequency)

What are the three dimensions of the cosmic haystack?

What was project Ozma? Who did it?

What was Ozma II (how does it differ from Ozma I)

What was the “magic frequency” for them both?

What did Dixon and Cole do? When?

What did Paul Horowitz do?
What was project META and Sential? How do they relate to Ozma?
What was project Pheonix?
Project BETA?
What frequency where most searches done in? Why?
What is the Kuiper_Morris frequency?
What dimension has the cosmic haystack been least explored?
What were the two strategies adopted by the search NASA (project Pheonix)? What other searches were similar to it? How many stars were covered? How far out?
What did Barney Oliver propose
What was project Cyclops? How many stars monitored?
What is the VLA?

***NOTE:** because of the large amounts of projects, make sure to know each one and which ones are similar to others. Also, know the order in which they occurred. Because there are so many people, know who did what, what projects they started, theories they had, etc. Also, try to know them chronologically. BECAUSE THERE ARE SO MANY OF EACH I WOULD ASSUME THIS TO BE VERY IMPORTANT (but I could always be wrong).*

Chapter 10

Interstellar travel

What is N for the number of planets with life (just life, not advanced)? (May have to calculated it, so know all the parts)
What are the 3 motivations for interstellar travel?

Can we visit them?

List order of exploration of solar system from the earliest to the most recent
What is the lowest mass ration mission that could be done?
What is project Orion? Why was it cancelled?
What are the problems with nuclear fusion for fuel? What are the ways around it?
What was project Daeduls? What was the chosen fuel for it (fusion of what elements)?
Describe the Daeduls project (objective, fuel, the 2 stage ship, etc)
What is the most effective possible propuksion system? What are some of the problems associated with it?
What did Robert Bussard suggest?
What is the cataclysmic ramjet
List several ways around the problem of carrying vast amounts of fuel (describe them).
What is time dilations? What is required to have time stop? (that's so cool)
What happens to mass as velocity approaches the speed of light? Why is this a problem for space travel?
What theoretical ways are there around the speed of light limit?
What are Bracewell probes? Describe in steps what they do. What are their advantages? Disadvantages?

Colonization of the Galaxy

What does R_m stand for?

What is the estimated time to colonize the galaxy?

What are the consequences of galactic colonization

What was the Hart Hypothesis

What are the 5 possible explanations?

What was Hart's conclusion?

Describe the 4 possible things that are wrong in the argument that colonization will be easy and fast

What is a Von Neuman device?

Describe the Tipler and Zuckerman Variation

Have they visited us?

Describe the 4 categories of UFO's

Describe the experiment done by Ian Ridpath

Words to know:

Quantum limit

Magic frequency

Interference

Water hole

Vertical, horizontal, and circular polarization

Amplitude Modulation

Frequency Modulation

Interstellar scintillation

LGMs

Pulsars

Masers

Cryptography

Anicryptography

Unintentional signals

Omnidirectional

Sensitivity

Beam

Spectrum analyzer

Bandwidth

Barnard's star

Time dilation

Warp drive

Hart Hypothesis

Von Neuman device

Tipler variation

People

Joaly Bell

Morrisson and Cocconi

Ben Zuckerman and Pat Palmer

Dixon and Cole

Paul Horowitz

Ron Bracewell

Duncan Lunan

Michael Hurt

Frank Tipler

Ben Zuckerman

Ian Ridpath