SIRTF
NASA's Space InfraRed Telescope Facility

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It’s not always so cold in space...

“Revenge is a dish best served cold, and it’s very cold in space.” -- Khan
Observatories for Any “Temperature”
Wavelength

 ![Wavelength Diagram](image)

<table>
<thead>
<tr>
<th>Radiation Type</th>
<th>Wavelength (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>$10^4$</td>
</tr>
<tr>
<td>Microwave</td>
<td>$10^3$</td>
</tr>
<tr>
<td>Infrared</td>
<td>$10^{-2}$</td>
</tr>
<tr>
<td>Visible</td>
<td>$10^{-5}$</td>
</tr>
<tr>
<td>Ultraviolet</td>
<td>$10^{-6}$</td>
</tr>
<tr>
<td>X-ray</td>
<td>$10^{-8}$</td>
</tr>
<tr>
<td>Gamma Ray</td>
<td>$10^{-10}$</td>
</tr>
</tbody>
</table>

About the size of...
- Buildings
- Humans
- Honey Bee
- Pinhead
- Protozoans
- Molecules
- Atoms
- Atomic Nuclei
NASA’s Great Observatories
What wavelengths are easy to observe from the ground?
The Electromagnetic Spectrum

LOW TO HIGH ENERGY

TEMPERATURE SCALE

GAMMA RAYS  X-RAYS  UV  VISIBLE LIGHT  INFRARED  MICROWAVE  RADIO

SIRTF
Infrared Life
The “Thermal” (or “Far”) Infrared
“Emission” from a Cold-blooded Lizard

Optical Image

Far-Infrared Image

“Room Temperature”
Emission & Absorption

Emitter → "Emission"

Absorber → "Absorption"
Emission

Emitter

“Emission”
Absorption

Absorber

“Absorption”
Not all Wavelengths are Absorbed Equally

“Dust Grain”

Light is “Extinguished” & Does not Reach Us

Light Goes Right by & Reaches Us
The Dark Cloud B68 at Different Wavelengths (NTT + SOFI)
SIRTF

NASA’s Space InfraRed Telescope Facility

Launch set for April 15, 2003

“Great Observatory” for Near- and Far-Infrared Astronomy
Real Star Formation

Today’s Tour:

Optical and Infrared Views of Orion

Simulated Star Formation
Far-infrared Image

Orion
Near-infrared Image

Orion Nebula
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