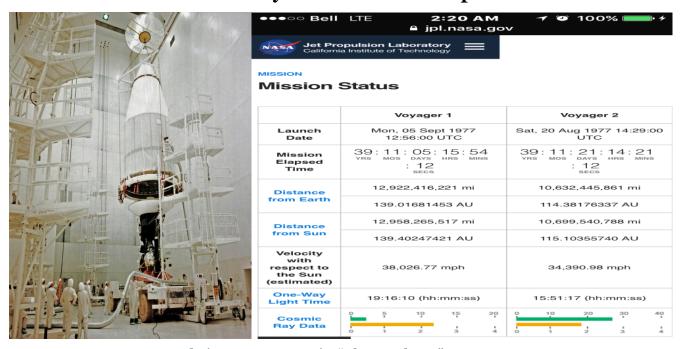
KINEMATICS

Units 4 & 5 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin

Texas., & New York Times, August 10, 2017, by Andy Webster

Review: A True-Life Journey Into Interstellar Space in 'The Farthest'



Voyager 2 at Cape Kennedy in 1977, as seen in "The Farthest."
For any believer in humankind's instinct to transcend boundaries, the Voyager 1 and Voyager 2 space probes, and

the NASA team that produced them, inspire awe. "The Farthest," a dazzling documentary written and

to increase the odds of success); in 1979 Voyager 1 began relaying information from Jupiter, and in

1980 approached Saturn and its moon Titan, nearly a billion miles from Earth))) In 1986, Voyager 2

reached Uranus, and three years later Neptune. In 2012, Voyager 1 became the first man-made object to exit our solar system and enter interstellar space, from which it still sends signals. (Voyager 2 is en route.) The accounts of scientists, whose enthusiasm still glows, is as wondrous as the technology seen here. Linda Morabito, a navigation engineer, recalls discovering gas plumes on Jupiter's moon Io. "I had the first evidence of active volcanism beyond Earth," she says, beaming. Time-lapse Voyager-eye views of planets as they get nearer convey a sense of the epiphanies experienced in mission control.

INTRODUCTION: Two objectives with this application: (a) Confirm speed of Voyager's spacecraft as stated by NASA as ~38,000 mph. (b) Confirm speed of light as 186,000 mi./s. with the NASA data in table above.

QUESTIONS: (a) In the article it is stated the voyager spacecraft went Billion miles from 1977 to 1980 (3 years). Find the spacecraft's speed in mph?, (b) In the data table above on the Voyager: The distance from earth is listed as 12.922 X 10⁹ miles and time for a signal (electromagnetic wave) to reach the earth from the spacecraft is 19 hrs, 16 minutes. Confirm speed of light is 186,000 mi,/s.?

HINTS: 365 days/year, 24 hrs./day, 3600 s./hr., 60 s,/min., x = v t

ANSWERS: (a) ~38,0052 mi./hr., close to what NASA web site says the speed of voyager is., (b) ~186,300 mi./s.

Speed of electromagnetic waves(light) is stated by NASA as ~ 186,000 mi./s....works fine.