To summarize the discussion thus far: the chance of space travelers existing at planets attached to neighboring stars is very much greater than the change of space-traveling Martians. The one can be viewed almost as a certainty (if the assumptions are accepted), whereas the other is very slight indeed.

In order to estimate the relative chances that visitors from Mars or star X could come to the Earth and act like "flying objects", some discussion of characteristics of space ships is necessary.

To handle the simple case first, a trip from Mars to Earth should be feasible using a rocket-powered vehicle. Once here, the rocket would probably use more fuel in slowing down for a landing than it did in initial takeoff, due to Earth's higher gravitational force.

A rough estimate of one-way performance can be found by adding the so-called "escape velocity" of Mars to that of the Earth plus the total energy change (kinetic and potential) used in changing from one planetary orbit to the other. These are 3.1, 7.0, and 10.7 miles per second, respectively, giving a total required performance of 20.8 miles per second for a one-way flight. Barring a suicide mission, the vehicle would have to land and replenish or else carry a 100% reserve for the trip home.

Let us assume the Martians have developed a nuclear, hydrogen-propelled vehicle (the most efficient basic arrangement that has been conceived here on Earth) which uses half its stages to get here and the remaining stages to return to Mars, thus completing a round trip without refueling, but slowing down enough in our atmosphere to be easily visible (i.e., practically making a landing). Since it is nuclear powered, gas temperatures will be limited to the maximum operating temperatures that materials can withstand (heat must transfer from the pile to the gas, so cooling can't be used in the pile). The highest melting point compound of uranium which we can find is uranium carbide. It has a melting point of 4560°R. Assume the Martians are capable of realizing a gas temperature of 4500°R (= 2500°K), and that they also have alloys which make high motor pressures (3000 psi) economical. Then the specific impulse will be I = 1035 seconds and the exhaust velocity will be c = 33,400 ft/sec (reference 5). Calculation shows that using a single stage for each leg of the journey would require a fuel/gross weight ratio of 0.96 (for each stage) too high to be practical. Using two stages each way (four altogether) brings the required fuel ratio down to 0.81, a value that can be realized.

If, by the development of strong alloys, the basic weight could be kept to 10% of the total weight for each stage, a residue of 9% could be used for payload. A four stage vehicle would then have a gross weight $\left(\frac{100}{9}\right)^4$ = 15,000 times as great as the payload: thus, if the payload were 2,000 pounds, the gross weight would be 30 million pounds at initial takeoff (Earth pounds).