

1. **Optics marketplace.** Select your favorite site for business literature (e.g., the *Red Herring*, www.redherring.com) and one among the following sub-disciplines of optics: optical networking (devices or systems), biomedical optical imaging, optical metrology, optical lithography, and optical MEMS. Run a modest search with the appropriate keyword and, after reading a few articles, write a short paragraph (approximately half a page) describing some technological issues that are deemed critical for business success.

2. **Optical telescopes.** You may have heard the following buzzwords in the popular literature: the Chandra telescope, the Hale telescope at the Mount Palomar observatory, and Very Large Array telescope in Socorro, Mexico. (The movie *Contact* makes extensive references to the latter.) Use your favorite web search engine (e.g., Google, www.google.com) or run an old-fashioned library search and explain briefly (less than half a page) how they operate, and how they are different in terms of some key performance parameters.

3. **The lifeguard problem.** The lifeguard shown below can run at speed c on the sand, and swim at speed c/n ($n > 1$) in water. He is standing distance d_1 from the beach, and notices a swimmer in danger at distance h along the coastline and d_2 away from the coastline. Plan the lifeguard's path that reaches the swimmer in minimum time.

