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https://www.100test.com/kao_ti2020/290/2021_2022_GRE_E9_98_85_E8_AF_BB_E7_c86_290649.htm Passage 8 问题解决型（中微子）文章的引题：为什么要研究中微子，中微子的性质是什么 Virtually everything astronomers known about objects outside the solar system is based on the detection of photons光子 quanta量子（单数：quantum） of electromagnetic电磁 radiation辐射. Yet（转折，上一句不用看） there is another form of radiation that permeates the universe: neutrinos微中子. 第一个性质：不跟人家发生反应 With (as its name implies) no electric charge, and negligible mass, the neutrino interacts with other particles so rarely*6A*7E that（因果关系） a neutrino can cross the entire universe, even traversing substantial aggregations of matter, without being absorbed or even deflected. Neutrinos can thus escape from regions of space where light and other kinds of electromagnetic radiation are blocked by matter. 第二个性质：身上携带宇宙信息 Furthermore, neutrinos carry with them information*4D about the site and circumstances of their production: therefore, the detection of cosmic neutrinos could provide new information about a wide variety of cosmic phenomena and about the history of the universe. 提出探测的问题：要找一个方法满足研究中微子的两个前提 But how can scientists detect a particle that interacts so infrequently with other matter? Twenty-five years（证明非常难以探测） passed between Pauli's hypothesis that the neutrino existed and its actual detection: since then virtually all research with

neutrinos has been with neutrinos created artificially*9C (人工产生, cosmic是宇宙中来的, 两者非常不同) in large particle accelerators and studied under neutrino microscopes. But (转折之后更重要, 探测的对象不同, 之前是人工产生的粒子, 之后是宇宙中来的粒子) a neutrino telescope, capable of detecting cosmic neutrinos, is difficult to construct. 第一个条件No apparatus can detect neutrinos unless it is extremely massive (提出条件: 仪器特别巨大), because (原因, 可暂时不看) great mass is synonymous with huge numbers of nucleons (neutrons and protons), and the more massive the detector, the greater the probability of one of its nucleon 's reacting with a neutrino. 第二个条件In addition, the apparatus must be sufficiently shielded from the interfering effects of other particles.问题解决了Fortunately, a group of astrophysicists has proposed a means of detecting cosmic neutrinos by harnessing (重点内容) the mass (满足了上文的条件一) of the ocean. Named DUMAND, for Deep Underwater Muon (muon: n. μ 介子) and Neutrino Detector, the project calls for placing an array of light sensors at a depth of five kilometers under the ocean surface. The detecting medium is the seawater itself: when a neutrino interacts with a particle in an atom of seawater, the result*8 is a cascade散发 of electrically charged particles and a flash of light*8D that can be detected by the sensors. The five kilometers of seawater above the sensors will shield (满足了上文的条件二, 下文可以不用再读) them from the interfering effects of other high-energy particles raining down through the atmosphere.中微子的研究对天文学的影响The strongest motivation for the

DUMAND project is that it will exploit an important source of information (指的就是中微子) about the universe. The extension of astronomy from visible light to radio waves to x-rays and gamma rays never failed to 从来 (=always) lead to the discovery of unusual objects such as radio galaxies, quasars, and pulsars. Each of these discoveries came as a surprise. Neutrino astronomy*2*3A will doubtless bring its own share of surprises*2C.

1. Which of the following titles best summarizes the passage as a whole? 主题题 (内容性 : 三出现原则) (A) At the Threshold 开端 of Neutrino Astronomy (B) Neutrinos and the History of the Universe 细节 (C) The Creation 细节 and Study of Neutrinos (D) The DUMAND System and How It Works 只和第三段有关 (A) (E) The Properties of the Neutrino 只和第一段有关 , 细节 2.

With which of the following statements regarding neutrino astronomy*2 (最后一段) would the author be most likely to agree? 信息题 (有定位) (A) Neutrino astronomy will supersede 淘汰 all present forms of astronomy. (B) Neutrino astronomy will be abandoned if the DUMAND project fails. (C) Neutrino astronomy can be expected to lead to major breakthroughs*2C in astronomy. (D) Neutrino astronomy will disclose phenomena that will be more surprising than (慎重对待比较级选项) past discoveries. (C) (E) Neutrino astronomy will always be characterized by a large time lag between hypothesis and experimental confirmation. 3. In the last paragraph, the author describes the development of astronomy in order to 举例作用题 (A) suggest that the potential findings of neutrino astronomy*3A can be

seen as part of a series of astronomical successes为引出中微子天文学的发展(B) illustrate the role of surprise in scientific discovery(C) demonstrate the effectiveness of the DUMAND apparatus in detecting neutrinos(D) name some cosmic phenomena that neutrino astronomy will illuminate (A) (E) contrast the motivation of earlier astronomers with that of the astrophysicists working on the DUMAND project 100Test 下载频道开通，各类考试题目直接下载。详细请访问 www.100test.com