

Two-Observer Spacetime Diagrams and Lorentz Transformations

Physics II: Modern Physics

College of the Atlantic

- The figure below shows a two-observer spacetime diagram.
 - What is the speed of the moving observer?
 - For each event (A,B,C), determine the coordinates in the unprimed and primed frames.
- Beowulf is moving at a constant speed of 0.8 with respect to Anastajia. Ana observes an event Q as taking place at a time of 4 seconds and a position of 10 seconds. What are the spacetime coordinates for event Q in Beowulf's frame?
- Anastajia is at rest and Beowulf is moving at a constant speed of $2/5$ with respect to Ana. An event occurs at a time $t = 6\text{s}$ and position $x = 10\text{s}$ as observed in Ana's frame. What are the spacetime coordinates of this event according to Beowulf. Answer both analytically (using the Lorentz transformations) and graphically (using a two-observer spacetime diagram).

