

Visualizing sidereal and solar time in honor of Karl Jansky: Internship at IEEE, AT&T, and Bell Labs

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Abstract

In order to understand the significance of any discovery, it is essential to understand the historical context in which it emerged and the shared effort that influenced its development. Bell Labs is an industrial research institution known for foundational advances in communications, physics, and engineering, which provided the environment in which Jansky first identified radio emissions from the Milky Way. This project through the mentorship with IEEE, AT&T Labs, and Bell Labs employs interactive visualizations of time on Mars and Earth on a website, a street clock representation of Mars' sidereal and solar time, and an a novel digital sundial to bring his discoveries to life for a broad public audience. The website uses HTML, JavaScript, and p5.js to model planetary rotation and orbital motion while telling the full story of Karl Jansky's life, discovery process, and contributions to radio astronomy. Designed for installation at the Dr. Robert Woodrow Wilson Park, the Bell Labs Horn Antenna site in Holmdel, the project features a dual-sided clock displaying Mars sidereal time on one side and Mars solar time on the other, allowing viewers to directly compare these two timekeeping systems. In addition, there will be an improved digital sundial, intended to become one of the largest and most accurate of its kind. Overall, the project connects modern science to the historical roots of radio astronomy in a way that is engaging and accessible to all ages.

Index Terms

AT&T, Bell Labs, Karl Jansky, sidereal time, internship