# Deep Pulsar Searches in Ultra-Faint Dwarf Galaxies

Jesse Feddersen
*Department of Astronomy, Yale University*

Our search for pulsars in ultra-faint dwarf galaxies will address three main science goals:

1. The discovery or a pulsar in a UFD would be the **first known extragalactic pulsar outside of the Magellanic Clouds**.

2. Placing observational limits on the pulsar population in UFDs will provide the first **constraint on the high-mass initial mass function** (IMF) of the oldest dynamically unevolved stellar populations.

3. By measuring the dispersion of the pulses from a pulsar in a UFD, we **probe the electron density of the intergalactic medium** towards that line of sight.

We justify each of these goals in turn.

## 1. First of its Kind

## 2. Constraining the High-Mass IMF

The initial mass function is the distribution of stellar masses in a stellar population at the beginning of star formation. The IMF determines the evolution of the population and is a crucial input in models of synthetic stellar populations. The form of the IMF affects many galaxy parameters derived from stellar population synthesis The form of the IMF also places a constraint on star formation theory, which must predict the observed IMF. In the Milky Way, the IMF is typically parametrized by the similar **?** or **?** laws with little variation across a range of star-forming environments (**?**).
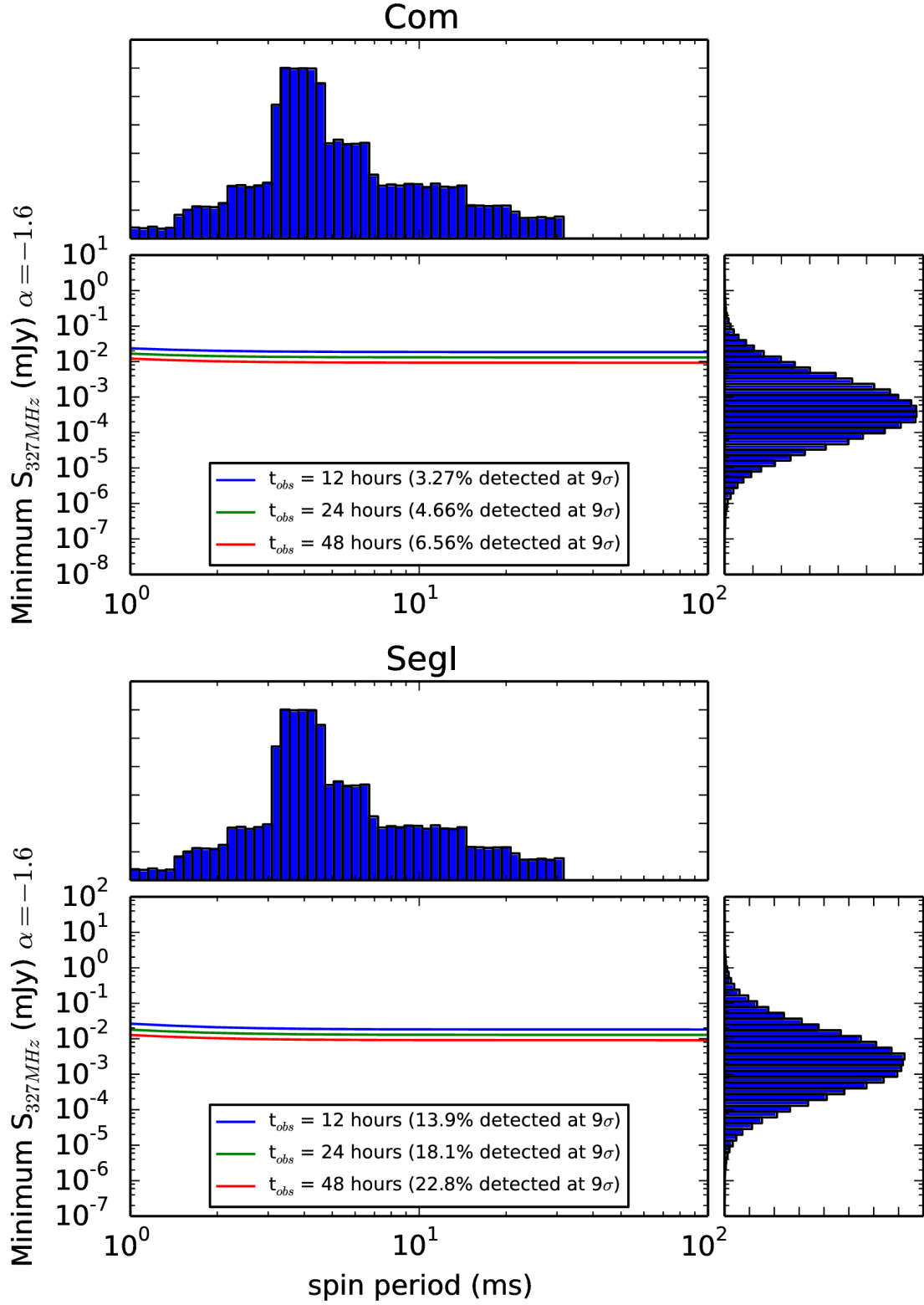
## 3. Probing the Intergalactic Medium

## Com



## SegI



Fig. 1.— Replace this text with your caption