

# a tintinnabulation of cosmic scintillation

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the pitches in this piece correspond to those produced by pulsars from the 47 tucanae globular cluster situated in the region of the tucana constellation, approximately 16,000 light years from earth. a pulsar is a spinning neutron star emitting a beam of radio waves. these spinning stars behave like lighthouses, constantly blinking their radio signals at us. the pulsars in 47 tucanae spin at speeds up to hundreds of times per second and these radio signals can be rendered directly as an audible tone. cosmic scintillation refers to the interference these pulsar signals are subjected to as they travel through the interstellar medium such as gas, cosmic rays, dust and atoms. the pulsar signals are constant but we receive individual pulsar signals on earth from the 47 tucanae cluster at different times and for different durations, defined by their interference with this space debris as they journey through the cosmos and resulting in a constantly sounding and ever changing chord.

tintinnabulation is a musical term simply meaning the repeated use of the same chord in different inversions or guises.

the generative starting points for this piece are: the pitches produced by the pulsars, and, the use of tintinnabulation to recreate the scintillation they undergo as they travel through the cosmos.

notes for performers:

1. performers or sound designer selects individual pitches to play from the 47 tucanae cluster.
2. the duration of the pitch is determined by the limitations of their instrument or voice; for instance their length of breath or bow. performers are free to explore duration.
3. the chord produced is set at random by the choices of the performers as they select their notes from pitches derived from the 47 tucanae cluster.
4. different pitches can be selected each time or performers may wish to select just one.
5. the soundscape created will depend on the instrument/s or voices used and performers can explore how to make this process work best for their instrument.
6. musicians or sound designer can play with the tones and chords they create to explore dynamics, tone colours, textures, tonality, tuning and harmonics as well as interactions occurring in the group and anything else that emerges.
7. performers are free to explore the sounds that occur as they play and interact together and follow the soundscape they create as it unfolds in the moment.
8. performers should not worry about playing the tones exactly 'in tune'.
9. the duration of this piece is totally open and is set by the performers or sound designer.

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