

Fibonacci in a Black Hole

for solo clarinet

as part of the thesis:

**The Composition of New Music Inspired by Music
Philosophy and Musical Theoretical Writings from Ancient
Greece**

Coreen Emmie Rose Morsink

Goldsmiths, University of London

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Quotation for Movement I

"If something falls into a black hole and it emits light at regular intervals as it falls in, the light will become redder and red and the intervals between the light pulses will become longer and longer. In the sound wave analogy, if a clarinet were to fall into a "black hole", before it falls in the notes will become lower and lower, and the time between tones will become very long and quiet."

-Dr. Sharon Morsink, University of Alberta

General Notes to Performer:

Fibonacci (Leonardo Pisano Bogollo c. 1170 - c. 1250) series: 0,1,1,2,3,5,8,13,21,34,55,89 etc.

Each phrase has a climax at the Golden Ratio of 1.618 (61.8% of the phrase) as well as the overall piece counting the quavers. Thus if the piece has 233 eighth notes, the climax will be at 144; climax at 89; climax at 55, etc.

site for multiphonics used:

<http://www.clarinet-multiphonics.org/clarinet-multiphonics.html> Nicolas del Grazia, website 15-02-2010

Recommended fingerings for multiphonics written above notes except for some spectral harmonics: when the same note is repeated later in the score it is recommended to use the previously mentioned fingering. When the bottom note remains the same but the top note changes, the fingering for the previous notes are recommended.

Accidentals only affect the note they precede.

Fibonacci in a Black Hole

dedicated to Sharon Morsink

1

all things are known by number

"And all things, indeed, that are known have number:
for it is not possible for anything to be thought of or known
without this." Philolaus (c470-385BC)

Coreen Morsink

Clarinet in B \flat

$\text{♩} = 100$ gliss. as smooth as possible

p fff ff mf

\blacktriangle = blow air through clarinet pitch specified/unspecified

fingering for multiphonics

(same)

pppp

Perc.

x = click keys as many keys as necessary to make the desired dynamic level

pp mp ppp

f p fff p f

f pp p f

pp mf p f mf p

f

38

13:8

ff

13:8

mf

40

5

3

5

5

3

p

pppp

II
faster than the speed of light

"Anything that can travel faster than light can escape
from a black hole (as long as it hasn't hit the singularity).
Black holes are defined through the speed of light,
so they can only trap stuff that has to travel at light-speed or less."
-Dr. S. Morsink

The musical score is written for a single melodic line on a grand staff. It begins with a tempo marking of quarter note = 100. The piece starts in 4/4 time, marked *p* (piano) and *mp* (mezzo-piano). It features a complex rhythmic pattern of eighth and sixteenth notes, with some triplet markings. The time signature changes to 3/4, then 5/4, and finally 8/4. The dynamics range from *p* to *pp* (pianissimo). A *crescendo poco a poco* (gradually increasing) is indicated. The score includes various musical notations such as slurs, accents, and dynamic markings. A double bar line with repeat dots appears at the end of the piece. The score is divided into measures, with measure numbers 50, 51, 52, 53, 54, and 55 clearly marked.

III two black holes merge

Black holes could potentially collide head-on, but the more likely, and more interesting type of collision is when they are orbiting around each other and spiral in towards each other and finally merge into one larger black hole.
-Dr. S. Morsink

"The Fibonacci series can start on any number"
- conversation by math, chemistry and physics teachers
Vernon Waddington, Dr. Stuart Bond and Dr. Light

♩ = 100

56 *pp* *ppppp* *pp* *ppp*

60 *p* 61 *mp*

62 *p* 63 *mf*

Ideally, the ossia stave to be played.

64 *p* 65 *mf*

66 *f* 67 *ff*

68 *ff* 69 *ffff*