

Perspectives

By Elaine diFalco

Based on the Logarithmic Map of the Universe

by J. Richard Gott

Text by Beverly Jean Morrison

Notes

Translating the Map into Music: The manner in which this piece translates J. Richard Gott III and Mario Juric's conformal map of the universe into music is by assigning the x- and y-axes of the map (the expanse of the observable universe and the Earth's circumference respectively) to correspond with pitch and time, and to which the percussion and soprano parts are oriented in opposing fashion. Every measure lasts ten seconds; therefore every page is one minute. For the percussionist, each minute represents a category of distance measurement, i.e. the first minute corresponds to the portion of the map representing kilometers, the second minute is AUs, and so on. For the soprano, every measure represents forty minutes of Earth rotation; therefore every page represents four hours, or six thousand, six hundred and eighty kilometers along the equator. The pitches for the percussion relate to the location of celestial objects as oriented to the circumference of the Earth (the y-axis) and the soprano's pitches represent the relative distance of celestial objects to the Earth (the x-axis). The references to celestial objects at the top of the systems correspond to the percussion pitches, whereas only the sun and moon are indicated for the soprano. The sizzle cymbal (to be performed by the soprano) represents clustered objects of various densities such as the asteroid belt, Kuiper belt, Hipparcos stars, and various distant galaxies. (The map and related information can be found at <http://www.astro.princeton.edu/universe/>)

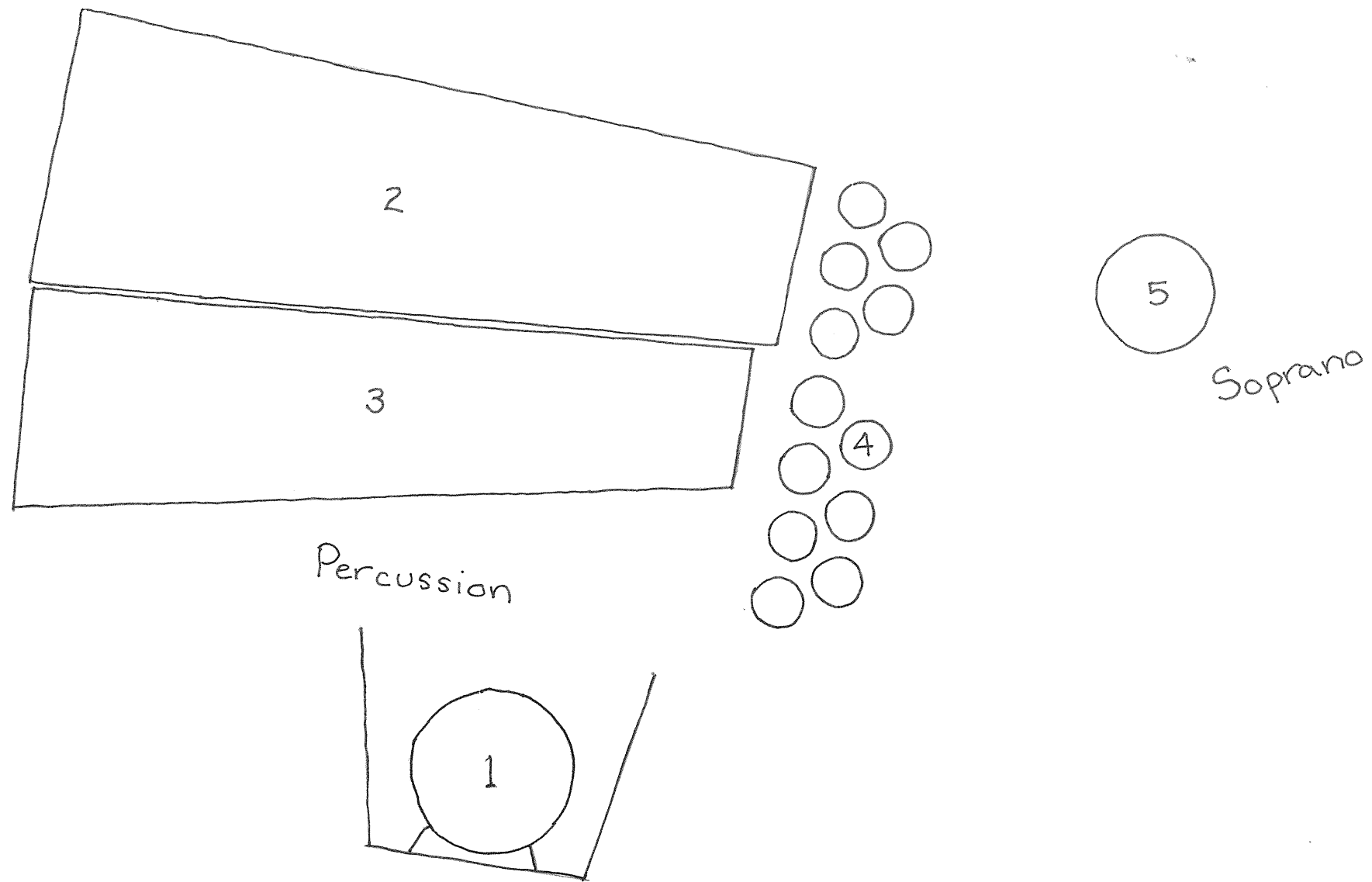
Performance :

Percussion: Every note is to ring freely except where noted in measures 0'40" through 0'50". Therefore, the vibraphone pedal should be applied accordingly.

Soprano: The duration of notes is to be gauged by the lines extending from the text.

Each measure is ten seconds long and the seconds are marked for each performer to assist in the synchronization of both parts relative to each other.

Like the map itself, certain objects are identified and labeled specifically because they are considered important from our perspective. It is my hope that knowing what celestial objects certain notes and clusters represent will facilitate an internal reflection of their magnificence for the performer.



- ① Tam-tam - 4'10" - 5'10"; requires friction (superball) mallets, indicated by ^{fr fr} ♯ ♯
- ② Marimba
- ③ Vibraphone - requires bow
- ④ Crotales - though the illustration only indicates one octave, two octaves are required for this piece; C6-C8
- ⑤ Sizzle cymbal - to be played by soprano with wire brushes

0'00" [km] 0'10" 0'20"

Ionosphere, satellites, ISS, HST, Vanguard I Chandra

Tam-tam

Crotales

Vibraphone

Sizzle cymbal

Soprano

ppp fff mf mp pp p

pp fff mf mp pp

The view from here

0'30" 0'40" 0'50"

Moon WMAP, SOHO NEOs Mars, Mercury, Asteroid belt begins

tam

cr.

vb.

Siz.

Sop.

arco p f pp mp

ppp

mf mp ff fff

the great (+) eye of the universe

1'00" [AU]

Sun, Venus, Jupiter, other solar system objects

1'10"

Saturn, Uranus, Neptune, Pluto, Halley's comet, Kuiper belt

1'20"

Voyagers and other spacecrafts, dwarf planets, Heliopause

Handwritten musical score for the first system, including staves for tam, crot., vb., siz., and sop. with various annotations and dynamics.

Staff 1 (tam): Marked with a vertical line at the beginning. Dynamics include *fff* and a boxed *pp*.

Staff 2 (crot.): Marked with the word *arco*. Dynamics include *mf*.

Staff 3 (vb.): Dynamics include *mf*.

Staff 4 (siz.): Contains a dense field of dots representing a spatial or temporal distribution.

Staff 5 (sop.): Features a melodic line with dynamics *fff*, *mp*, and *pp*. Includes a large slur and a note marked *pp* with a circled *n*.

Annotations: *up*, *(p) on*, *(n) pp*, *us*.

1'30"

(p) on

1'40"

Oort Cloud

1'50"

Handwritten musical score for the second system, including staves for tam, crot., vb., siz., and sop. with various annotations and dynamics.

Staff 1 (tam): Marked with a vertical line at the beginning.

Staff 2 (crot.): Marked with a vertical line at the beginning.

Staff 3 (vb.): Marked with a vertical line at the beginning.

Staff 4 (siz.): Marked with a vertical line at the beginning.

Staff 5 (sop.): Features a melodic line with dynamics *mp*, *ff*, and *pp*. Includes a large slur and notes marked *pp* and *p*.

Annotations: *(s)*, *watch*, *(fch)ing*, *sight*, *less*.

2'00" [pc]

Centauri and other stars

2'10"

2'20"

Stars with exoplanets

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

tam

crot.

vb.

siz.

sop.

mf

As ————— | we ————— | reach ————— | out ————— | a —————

pp, p, ff, f, mp, sporadic

2'30"

Beginning of Hipparcos stars

2'40"

Piades, Betelgeuse, Rigel & pulsars

2'50"

Nebulas

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

tam

crot.

vb.

siz.

sop.

pp

mf

mp

pp

arco

one hand

f

(arco)

- cross ————— (s) the ————— | vast ————— (st) ness and find ————— (d) there —————

3'00" [kpc]

Nebulas and a galaxy

3'10"

Milky Way Center

3'20"

Extent of the Milky Way

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

tam

(arco)

crot.

f (pp one hand)

mf

vb.

mp

siz.

sop.

f A ————— | p ne ————— mf ver ————— p (r) | f end ————— p f ————— mp (d)ing ————— | stream of stars —————

3'30"

Magellanic clouds, dwarf galaxies, beginning of Local group

3'40"

More galaxies

3'50"

Andromeda & other galaxies

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

tam

crot.

arco

vb.

marimba

ff

mf

siz.

sop.

f and ————— (d) | p dust ————— (st) | mf whose end —————

4'00" [mpc]

Various galaxies

4'10"

4'20"

Handwritten musical score for the first section (4:00-4:20). The score includes staves for tam, crot., mar., siz., and sop. The top staff (tam) has a measure with a box containing 'pp'. The crot. staff has 'arco' written above it. The mar. staff has several clusters of notes. The sop. staff has lyrics: "Is our (s) view be- gin-ning this (s) view be-". Dynamics include *p*, *mf*, *ff*, *mp*, and *pp*. There are also handwritten notes like *#0* and *#*.

4'30"

Great Attractor, Great Wall

4'40"

SDSS galaxies, Sloan Great Wall

4'50"

Handwritten musical score for the second section (4:30-4:50). The score includes staves for tam, crot., mar., siz., and sop. The top staff (tam) has a box with 'ff' and 'pp' and 'RH' written above it. The sop. staff has lyrics: "-tween sin (n) -gu lar (r) i ties". Dynamics include *pp*, *p*, *f*, *ff*, and *fff*. There are also handwritten notes like 'LH' and 'mf'.

5'00" 5'10" 5'20"

Accelerating/Decelerating, SDSS quasars

RH Ψ LH Ψ

tam

crot.

mar.

siz.

sop.

mp

p

fff Un (n) f mp bounds (s) US p (s) and (d) makes (kes)

5'30" 5'40"

Unreachable First stars Cosmic microwave background, Big Bang, Visibility limit

tam

crot.

mar.

siz.

sop.

ppp

pp

ppp

US (s) one