

# Ride the Cosmos

for three retuned, computer-driven pianos

by Kyle Gann

2017

## Technical Specifications

The 33-pitch tuning of the three pianos (the same in every octave) is as follows, given first in the number of cents above E-flat, and then as ratios to the E-flat 1/1:

Piano	1		2		3	
D	1088	15/8	977	225/128	1044	117/64
Db	969	7/4	938	55/32	906	27/16
C	857	105/64	773	25/16	840	13/8
B	738	49/32	755	99/64	729	195/128
Bb	702	3/2	590	45/32	609	91/64
A	551	11/8	551	11/8	481	169/128
Ab	471	21/16	440	165/128	408	81/64
G	386	5/4	320	77/64	342	39/32
Gb	204	9/8	275	75/64	275	75/64
F	155	35/32	192	143/128	192	143/128
E	92	135/128	53	33/32	27	65/64
Eb	0	1/1	1103	121/64	1173	63/32

Note that no string needs to be raised higher than its natural tuning except for the B-flat on piano 1, which is 2¢ sharp (or if one prefers, 2¢ could be subtracted from all quantities).

For electronic realization of the piece, it can prove helpful to reconfigure the tuning as a reference pitch in cycles per second for each piano, and ratios derived from that standard:

Tuning pitch:	38.891 cps	36.7641 cps	38.2833 cps
D	15/8	225/121	13/7
Db	7/4	20/11	12/7
C	105/64	200/121	104/63
B	49/32	18/11	65/42
Bb	3/2	180/121	13/9
A	11/8	16/11	169/126
Ab	21/16	15/11	9/7
G	5/4	14/11	26/21
F#	9/8	150/121	25/21
F	35/32	13/11	143/126
E	135/128	12/11	65/63
Eb	1/1	1/1	1/1

In the configuration of certain tuning softwares, the following sequences might facilitate getting the required tuning:

Piano 1:

38.891 = Eb0

1/1, 135/128, 35/32, 9/8, 5/4, 21/16, 11/8, 3/2, 49/32, 105/64, 7/4, 15/8

Piano 2:

36.7641485 = Eb0

1/1, 12/11, 13/11, 150/121, 14/11, 15/11, 16/11, 180/121, 18/11, 200/121, 20/11, 225/121

Piano 3:

38.283333 = Eb0

1/1, 65/63, 143/126, 25/21, 26/21, 9/7, 169/126, 13/9, 65/42, 104/63, 12/7, 13/7

For purposes of analysis, the entire scale (which I refer to as my 8x8 scale) is given below, grouping its pitches into eight harmonic series' on the 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup>, 13<sup>th</sup>, and 15<sup>th</sup> harmonics of E-flat, and naming each pitch in a typographical equivalent of Ben Johnston's just-intonation notation:

Pitch name	Ratio	Cents	1/1	3/2	5/4	7/4	9/8	11/8	13/8	15/8
Db^^-	121/64	1103						11		
D	15/8	1088	15	5	3					1
Db13	117/64	1044					13		9	
C#+	225/128	977								15
Db7	7/4	969	7			1				
C^	55/32	938			11			5		
C+	27/16	906		9			3			
C7+	105/64	857				15				7
Cb13	13/8	840	13						1	
B	25/16	773			5					
Bb^	99/64	755					11	9		
Cb77+	49/32	738				7				
Bb13	195/128	729							15	13
Bb	3/2	702	3	1						
Bbb713	91/64	609				13			7	
A+	45/32	590		15	9		5			3
Ab^	11/8	551	11					1		
Abb1313	169/128	481							13	
Ab7+	21/16	471		7		3				
G^	165/128	440						15		11
G+	81/64	408					9			
G	5/4	386	5		1					
Gb13	39/32	342		13					3	
Gb7^	77/64	320				11		7		
F#+	75/64	275			15					5
F+	9/8	204	9	3			1			
Fb13^	143/128	192						13	11	
F7+	35/32	155			7	5				
E+	135/128	92					15			9
Eb^	33/32	53		11				3		
Eb13	65/64	27			13				5	
Eb	1/1	0	1							
Eb7+	63/32	1173				9	7			

In Johnston's notation, + raises a pitch by 81/80, # raises it by 25/24, b lowers it by 24/25, 7 lowers it by 35/36, ^ raises it by 33/32, 13 raises it by 65/64, and F-A-C, C-E-G, and G-B-D are all perfectly tuned 4:5:6 major triads.

A couple of notes on listening to *Hyperchromatica*:

Some people think the piano sounds seem “funny” or “unreal.” It is essential to the timbre of a normal piano that the intervals are slightly out of tune, and surrounded by the fuzziness of the resulting beats. Remove that out-of-tuneness and the piano can sound different than you’re used to. It has always been common for me to play La Monte Young’s *The Well-Tuned Piano* for people and have them respond, “Isn’t that electronic?” “It sounds more like bells than a piano.” Often one’s unfamiliarity with pure tuning is misperceived as a deficiency in the piano sound. Relatedly, when I issued a disc of Disklavier music in 2005, people sometimes commented, “Too bad you couldn’t use a real piano, because the electronic sounds are off-putting.” In fact, the Disklavier *was* a real, acoustic piano, with pluckable strings. It was tuned to 18<sup>th</sup>-century well temperament, the notes went by *very* fast, and so the divergences from normalcy made people’s brains convince them that it was an electronic piano, which was a false perception. Give yourself some time to listen to the pieces over and over, and you’ll probably get used to them. I can guarantee, after hundreds of listenings myself, that the harmonies make their own purely-tuned sense, and that their logic sinks in once you can anticipate what’s going to happen. One of the purposes of these pieces is to expand your musical perception.

The Disklavier (computer-driven piano, the digital manifestation of the player piano) is a different medium than the human-played piano. One can, and must, write for it differently. With a couple of deliberate exceptions, these pieces are not playable by humans. The composer forbids performance by humans (which can’t happen anyway), and will not cooperate with any such attempt. The computer-driven version is the final manifestation, and the only one contemplated or permitted. These pieces were written, after years of profound thought and experimentation, specifically for the Disklavier medium, without any compromise in what the music was intended to achieve. If it bothers you that the music you are listening to isn’t being played by humans, there are millions of piano recordings made by humans; go listen to them. There is too much music in the world for anyone to waste time listening to any music wishing it were something other than what it is. This music is produced mechanically, for mechanical rhythmic capabilities that I savor. I make this music public on the chance that there might be a handful of other people on the planet for whom the possibilities opened up here in terms of rhythmic and harmonic language might more than compensate for the loss of a few habitual comforts. If you are not one of those rare people, you can do the composer a favor by moving on without comment. I guarantee you will not alter his mind on the matter.

- Kyle Gann

# Ride the Cosmos

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2016-17

$\text{♩} = 100$

Piano 1

Piano 2

Piano 3

$\text{♩} = 100$

The musical score is divided into three systems, each for a different piano. The tempo is marked as quarter note = 100. The key signature is B-flat major. The score features complex rhythmic patterns, including triplets and 3:2 ratios, and is marked with fortissimo (fff) dynamics. The notation includes various musical symbols such as slurs, accents, and dynamic markings.

♩ = 85   ♩ = 72   ♩ = 55   ♩ = 42   ♩ = 37   ♩ = 33   ♩ = 25   ♩ = 140

Pno1

Pno2

♩ = 85   ♩ = 72   ♩ = 55   ♩ = 42   ♩ = 37   ♩ = 33   ♩ = 25   ♩ = 140

Pno3

4

Pno1

Pno3



7

Pno1

Pno3



9

Pno1

Pno2

*p*

Pno3

Pno1

Musical score for Pno1, measures 28-30. Measure 28 features a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 29 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 30 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). The key signature is one sharp (F#) and the time signature is 2/4.

Pno2

Musical score for Pno2, measures 28-30. Measure 28 features a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 29 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 30 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). The key signature is one sharp (F#) and the time signature is 2/4.

Pno3

Musical score for Pno3, measures 28-30. Measure 28 features a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 29 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). Measure 30 has a treble clef with a half note chord (F#4, A4) and a bass clef with a half note chord (F#2, A2). The key signature is one sharp (F#) and the time signature is 2/4.

The musical score is divided into three systems, each for a different piano part (Pno1, Pno2, Pno3). The score is in 11/16 time and consists of two measures. Measure 14 is in D major, and measure 15 is in D minor. Pno1 and Pno3 have identical parts, while Pno2 has a unique accompaniment. Pno1 and Pno3 feature a melodic line with a slur and a 'v' marking, and a bass line with a slur and a 'v' marking. Pno2 features a bass line with a slur and a 'v' marking, and a treble line with a slur and a 'v' marking. The score includes various musical notations such as slurs, accents, and dynamic markings.

14

Pno1

Pno2

Pno3

6:5

7:5

Pno1

16

21/16

21/16

21/16

6:5

7

v

Pno2

21/16

21/16

21/16

21/16

6:5

5

7

v

Pno3

21/16

21/16

21/16

21/16

6:5

v

17  $\flat e \dots$

Pno1

7

5

$\flat e \dots$

Pno2

$\flat e \dots$

Pno3

5

$\flat o \dots$

18 ♩ = 110

The musical score consists of three systems, each for a different piano (Pno1, Pno2, Pno3). Each system has a treble and a bass staff. The tempo is marked as ♩ = 110. The time signature is 11/16. Measure 18 starts with a treble clef and a key signature of one flat. Pno1 has a melodic line in the treble and a bass line in the bass. Pno2 has a similar pattern. Pno3 has a more complex melodic line in the treble with fingerings 5:3 and 5:3, and a bass line. Measure 19 features a key signature change to two flats and a time signature change to 13/16. Pno1 and Pno2 have melodic lines with a fingering of 5, while Pno3 has a bass line with a fingering of 5.

Pno1

Pno2

Pno3

20

Pno1

Pno2

Pno3

23

Pno1

Pno2

Pno3

25

Pno1

Pno2

Pno3

5:3 5:3 7:5

5:3 5:3 7:5

5:3 5:3 7:5



27

Pno1

Pno2

Pno3

7 7:6

7 7:6



29

Pno1

Pno2

Pno3

7:6

3:2

8:7

7:6

3:2

8:7

7:6

9

8:7

31

**Pno1**

*mf*

*pp*

**Pno2**

*mf*

**Pno3**

*mf* *p* *mf* *p* *mf* **7:5** *p*

14

34

Pno1

7:5

15/16

2/4

Pno2

3:2

15/16

2/4

Pno3

15/16

2/4



37

Pno1

13/16

Pno2

13/16

Pno3

13

13/16

38

Pno1

Pno2

Pno3

13

10:9

40

Pno1

Pno2

Pno3

5:4

5:4

5:4

3:2

*pp*

42  $\text{♩} = 100$

Pno1

Pno2

The musical score is divided into two systems. The first system, labeled 'Pno1', contains four staves. The top two staves are in treble clef, and the bottom two are in bass clef. The second system, labeled 'Pno2', contains three staves. The top two are in treble clef, and the bottom one is in bass clef. The time signature is 3/32, and the tempo is indicated as quarter note = 100. The key signature has one flat (B-flat). The score includes various musical notations such as eighth notes, quarter notes, and rests, with dynamic markings of *mf* (mezzo-forte) throughout.

44

rit. . . . . ♪ = 38

Pno1

Pno2

Pno3

The musical score is written for three piano parts, Pno1, Pno2, and Pno3, in a 3/2 time signature. The score is divided into two systems. The first system begins at measure 44 and ends at measure 52. The second system begins at measure 53 and ends at measure 60. Pno1 and Pno2 have complex melodic and harmonic lines, while Pno3 has a more rhythmic accompaniment. Dynamics include 'f' and 'rit.'.

46 ♩ = 100

Pno1

mf

mf

mf

mf

Pno2

mf

mf

mf

mf

Pno3

♩ = 100

mf

48 rit. . . . . 19

Pno1

Pno2

Pno3

The image displays a musical score for three piano parts, labeled Pno1, Pno2, and Pno3. The score is divided into two systems of measures. The first system covers measures 48 to 52, and the second system covers measures 32 to 36. Pno1 and Pno2 are each written for a grand staff (treble and bass clefs). Pno3 is written for a grand staff (treble, middle, and bass clefs). The music features complex chordal textures and melodic lines. Dynamics include *f* (forte) and *rit.* (ritardando). The score is marked with measure numbers 48, 52, 32, and 36. A *rit.* marking is present at the end of the first system, and a page number 19 is indicated at the top right.



50

Pno1

mf

mf

mf

mf

Pno2

mf

mf

mf

Pno3

mf

mf

mf

52

Pno1

Pno2

Pno3

The musical score consists of three systems, each for a different piano part (Pno1, Pno2, Pno3). Each system contains three staves (treble, middle, and bass clefs). The time signature is 3/32. Pno1 starts at measure 52 with a whole note chord of Bb2, D3, F3, Ab3. Pno2 has a rhythmic pattern of eighth notes with slurs. Pno3 has a similar rhythmic pattern with a bass line. The score includes measure numbers 52 and 21.

53

Pno1

*mp*

Pno2

*mp*

Pno3

*mp*

54

Pno1

Pno2

Pno3

55

Pno1

Pno2

Pno3

Piano score for measures 56-57. The score is divided into three systems, each with three staves (Pno1, Pno2, Pno3). The time signature is 32/32. The key signature has one flat (B-flat).

**System 1 (Measures 56-57):**

- Pno1:** Treble clef. Measure 56:  $p$  dynamics, eighth notes with accents, bracketed as 8:7. Measure 57: eighth notes with accents, bracketed as 6:5.
- Pno2:** Treble clef. Measure 56:  $p$  dynamics, eighth notes with accents, bracketed as 6:5. Measure 57: eighth notes with accents, bracketed as 6:5.
- Pno3:** Bass clef. Measure 56:  $p$  dynamics, eighth notes with accents, bracketed as 8:7. Measure 57: eighth notes with accents, bracketed as 6:5.

**System 2 (Measures 58-59):**

- Pno1:** Treble clef. Measure 58:  $p$  dynamics, eighth notes with accents, bracketed as 6:5. Measure 59: eighth notes with accents, bracketed as 6:5.
- Pno2:** Treble clef. Measure 58:  $p$  dynamics, eighth notes with accents, bracketed as 6:5. Measure 59: eighth notes with accents, bracketed as 6:5.
- Pno3:** Bass clef. Measure 58:  $p$  dynamics, eighth notes with accents, bracketed as 6:5. Measure 59: eighth notes with accents, bracketed as 6:5.

Piano score for measures 57-58. The score is divided into three systems, each with three staves (Pno1, Pno2, Pno3). The time signature is 31/32. The key signature has one flat (B-flat).

**System 1 (Measures 57-58):**

- Pno1:** Treble clef. Measure 57: eighth notes with accents, bracketed as 8:7. Measure 58: eighth notes with accents, bracketed as 8:7.
- Pno2:** Treble clef. Measure 57: eighth notes with accents, bracketed as 8:7. Measure 58: eighth notes with accents, bracketed as 8:7.
- Pno3:** Bass clef. Measure 57: eighth notes with accents, bracketed as 8:7. Measure 58: eighth notes with accents, bracketed as 8:7.

**System 2 (Measures 59-60):**

- Pno1:** Treble clef. Measure 59: eighth notes with accents, bracketed as 8:7. Measure 60: eighth notes with accents, bracketed as 8:7.
- Pno2:** Treble clef. Measure 59: eighth notes with accents, bracketed as 8:7. Measure 60: eighth notes with accents, bracketed as 8:7.
- Pno3:** Bass clef. Measure 59: eighth notes with accents, bracketed as 8:7. Measure 60: eighth notes with accents, bracketed as 8:7.

26

58

Musical score for measures 58-61. The score is divided into three systems, each with three staves labeled Pno1, Pno2, and Pno3. The time signature is 2/2. Measure 58 starts with a whole rest in Pno1 and Pno3, and a whole note chord in Pno2. Measure 59 features a complex texture with sixteenth-note chords in Pno1 and Pno3, and a whole note chord in Pno2. Measure 60 continues with similar textures. Measure 61 concludes with a whole rest in Pno1 and Pno3, and a whole note chord in Pno2. Chord ratios 6:5 and 8:7 are indicated for several chords.



59

Musical score for measures 62-65. The score is divided into two systems, each with three staves labeled Pno1, Pno2, and Pno3. The time signature is 2/2. Measure 62 features a complex texture with sixteenth-note chords in Pno1 and Pno3, and a whole note chord in Pno2. Measure 63 continues with similar textures. Measure 64 features a complex texture with sixteenth-note chords in Pno1 and Pno3, and a whole note chord in Pno2. Measure 65 concludes with a whole rest in Pno1 and Pno3, and a whole note chord in Pno2. Chord ratios 8:7 are indicated for several chords.

60

Pno1

Pno2

Pno3

8:7 8:7 8:7

*mp*

*mp*

*mp*

62

Pno1

Pno2

Pno3

*mp*

*p*

*p*

*mp*

*p*

*mp*

*p*

10:7 10:7

*p*





♩ = 111

66

The musical score is divided into two systems, Pno1 and Pno2. Pno1 consists of four staves (treble and bass clefs), and Pno2 also consists of four staves. The score is in 3/32 time, which changes to 5/4 time at the beginning of the second measure of each system. A 10:7 ratio is indicated in the first measure of Pno1. Dynamic markings include *p* (piano), *mp* (mezzo-piano), and *mf* (mezzo-forte). The score features complex rhythmic patterns and chordal textures.

68

Pno1

Pno2

Pno3

The musical score is for three pianos (Pno1, Pno2, Pno3) in 4/4 time, starting at measure 68. The key signature has one sharp (F#). Pno1 (top system) has a treble clef and a bass clef. Pno2 (middle system) has a treble clef and a bass clef. Pno3 (bottom system) has a treble clef and a bass clef. The score includes dynamic markings: *mf* (mezzo-forte) and *mp* (mezzo-piano). The music consists of chords and single notes, with some rests and slurs.

69  $\text{♩} = 100$

**Pno1**

*mp* *mp* *p* *mp*

**Pno2**

*mf* *mp* *p*

**Pno3**

$\text{♩} = 100$  *mp* *mp* *p*

Pno1

70

22:13

5

Pno2

22:13

5

13

9

5:3

Pno3

22:13

71

*mf*

*f* *mp*

*mf* *p*

*mf* *mf*

*mf* *mf*

22:13

5

22:13

*mf*

*mf*

$\text{♩} = 111$

$\text{♩} = 111$

Pno1

Pno3

Detailed description: This page of a musical score contains measures 71 through 74. It is divided into two main sections: Pno1 (Piano 1) and Pno3 (Piano 3).  
Pno1 (measures 71-74):  
- Measure 71: Treble clef, 13/32 time signature. The right hand plays a series of eighth notes with a dynamic of *mf*. The left hand plays a single eighth note. A slur with '22:13' is under the first two notes.  
- Measure 72: Treble clef, 13/32 time signature. The right hand continues with eighth notes. The left hand has a slur with '5' under two notes.  
- Measure 73: Treble clef, 2/4 time signature. The right hand has a dynamic of *f*. The left hand has a dynamic of *mf*.  
- Measure 74: Treble clef, 2/4 time signature. The right hand has a dynamic of *mp*. The left hand has a dynamic of *p*.  
Pno3 (measures 71-74):  
- Measure 71: Treble clef, 13/32 time signature. The right hand has a dynamic of *mf*. The left hand has a dynamic of *mf*. A slur with '22:13' is under the first two notes.  
- Measure 72: Treble clef, 13/32 time signature. The right hand has a dynamic of *mf*. The left hand has a dynamic of *mf*. A slur with '22:13' is under the first two notes.  
- Measure 73: Treble clef, 2/4 time signature. The right hand has a dynamic of *mf*. The left hand has a dynamic of *mf*.  
- Measure 74: Treble clef, 2/4 time signature. The right hand has a dynamic of *mf*. The left hand has a dynamic of *mf*.  
Tempo markings:  $\text{♩} = 111$  are present at the top right of the Pno1 and Pno3 sections.

73 ♩ = 100

**Pno1**

**Pno2**

**Pno3**

*mf* *mf* *mf* *f* *f* *mf* *f*

5 7 3 13:10 11:10 13:10 11:10 5:4 13:10 20:11 11:10

♩ = 100

Pno1

74

*f*

5:4 13:10

*f*

20:11 11:10

3 7

*f*

Pno2

*f*

5 13:10

*f*

20:11 11:10

*mf*

3 7

Pno3

*f*

5:4 13:10

*f*

20:11 11:10



75

Pno1

Pno2

Pno3

The musical score consists of three piano parts, Pno1, Pno2, and Pno3, each with a grand staff (treble and bass clefs). The music is in 3/32 time and begins at measure 75. Pno1 features a complex melodic line with dynamics ranging from *f* to *p*, including accents and slurs. Pno2 and Pno3 provide harmonic support with similar rhythmic motifs. The score includes various dynamic markings such as *f*, *mf*, *mp*, and *p*, as well as articulations like accents and slurs. Rhythmic markings such as 10:11, 12:11, and 13:11 are present, indicating specific rhythmic relationships or phrasing. The piece concludes with a final *f* dynamic marking.

76 ♩ = 111

Pno1

Musical score for Pno1, measures 76-80. It consists of four staves. The top two staves are in treble clef, and the bottom two are in bass clef. The time signature is 5/4. The music features a melody in the upper right of the first staff and chords in the other staves. A piano (*p*) dynamic marking is present in the second measure of the bass staves.

Pno2

Musical score for Pno2, measures 76-80. It consists of four staves. The top two staves are in treble clef, and the bottom two are in bass clef. The time signature is 5/4. The music features a melody in the upper right of the first staff and chords in the other staves. A piano (*p*) dynamic marking is present in the second measure of the bass staves.

♩ = 111

Pno3

Musical score for Pno3, measures 76-80. It consists of three staves. The top staff is in treble clef, and the bottom two are in bass clef. The time signature is 5/4. The music features a melody in the top staff and chords in the bottom staves.

77  $\text{♩} = 100$

Pno1

Pno2

Pno3

$\text{♩} = 100$

*f*

*f*

*f*

*mf*

*mf*

*mf*

18:11

18:11

18:11

3:2

3:2

18:11

18:11

18:11

3:2

78

Pno2

*p*

*p*

*p*

33

29

25:16

79

Pno2

33

25:16

29



80

Pno1

Pno2

29

pp

29

pp

29

pp

29

pp

pp

81

Pno1

Pno2

Pno3

*pp*

The musical score consists of three systems, each for a different piano (Pno1, Pno2, Pno3). The time signature is 18/32. Pno1's part features a melodic line with a slur and a fermata. Pno2's part features a rhythmic accompaniment with slurs and a fermata. Pno3's part features a sparse accompaniment with a fermata. The score ends with a piano (*pp*) dynamic marking.

82

Pno1

Pno2

Pno3

*pp*

*pp*

*pp*

Detailed description: The image shows a page of musical notation for three piano parts, labeled Pno1, Pno2, and Pno3. The music is in 3/2 time. Pno1 consists of three staves (treble, middle, and bass clefs). The top staff has a melody with a slur and an accent (>) over a half note. The middle staff has a melody with a slur and an accent (>) over a half note. The bottom staff has a melody with a slur and an accent (>) over a half note. Pno2 consists of two staves (treble and bass clefs). The top staff has a melody with a slur and an accent (>) over a half note. The bottom staff has a melody with a slur and an accent (>) over a half note. Pno3 consists of three staves (treble, middle, and bass clefs). The top staff has a melody with a slur and an accent (>) over a half note. The middle staff has a melody with a slur and an accent (>) over a half note. The bottom staff has a melody with a slur and an accent (>) over a half note. There are dynamic markings *pp* (pianissimo) in the Pno3 section. The page number 82 is at the top left.

83

Pno1

Pno2

Pno3

The musical score consists of three systems, each for a piano (Pno1, Pno2, Pno3). Each system has three staves (treble, middle, and bass clefs). The time signature is 3/32. The score begins at measure 83. Pno1 has a sparse melody with notes and rests. Pno2 and Pno3 have more active parts, including dense runs of beamed notes and rests. The notation includes various note values, rests, and dynamic markings like accents.

84

Pno1

Pno2

Pno3

43

32

86

Pno1

Pno2

Pno3



87

The image shows a musical score for three piano parts, labeled Pno1, Pno2, and Pno3. The score is in 3/32 time and begins at measure 87. Pno1 (top system) features a melodic line in the right hand with a slur and a fermata, and a bass line with a similar slur and fermata. Pno2 (middle system) has a right-hand part with a slur and a fermata, and a bass line with a slur and a fermata. Pno3 (bottom system) has a right-hand part with a slur and a fermata, and a bass line with a slur and a fermata. The notation includes various accidentals (sharps, flats, naturals) and dynamic markings (accents).

88

Pno1

Pno2

Pno3

*pp*

*pp*

Detailed description: This system contains measures 88, 89, and 90. It features three piano parts: Pno1, Pno2, and Pno3. Pno1 is a grand staff with treble and bass clefs. Pno2 is a single treble clef staff. Pno3 is a grand staff with treble and bass clefs. The music is in 3/32 time. Measure 88 starts with a piano (*pp*) dynamic. Pno1 has a melodic line with a slur and a fermata over the final two notes. Pno2 has a rhythmic accompaniment. Pno3 has a bass line with a slur and a fermata. Measure 89 continues the melodic and rhythmic patterns. Measure 90 concludes the system with a final chord and fermata. The dynamic *pp* is indicated at the beginning of measure 88 and again at the end of measure 90.

89

Pno1

Pno2

*pp*

Detailed description: This system contains measures 89, 90, and 91. It features two piano parts: Pno1 and Pno2. Pno1 is a grand staff with treble and bass clefs. Pno2 is a grand staff with treble and bass clefs. The music is in 3/32 time. Measure 89 starts with a piano (*pp*) dynamic. Pno1 has a melodic line with a slur and a fermata over the final two notes. Pno2 has a rhythmic accompaniment. Measure 90 continues the melodic and rhythmic patterns. Measure 91 concludes the system with a final chord and fermata. The dynamic *pp* is indicated at the beginning of measure 89 and again at the end of measure 91.

The musical score is divided into three systems, each for a different piano part: Pno1, Pno2, and Pno3. Each system contains three staves (treble and bass clefs). The score is marked with measure numbers 90, 99, and 108. The time signature is 3/32. The key signature changes from one flat (B-flat) to one sharp (F-sharp) at measure 99. The notation includes various musical symbols such as slurs, accents, and dynamic markings.

92

Pno1

Pno3

Musical score for measures 92-93. Pno1 (Piano 1) and Pno3 (Piano 3) are shown. Pno1 has a treble and bass staff. Pno3 has a treble and bass staff. The score includes various notes, rests, and dynamic markings like accents and slurs.



93

Pno2

Pno3

Musical score for measures 93-94. Pno2 (Piano 2) and Pno3 (Piano 3) are shown. Pno2 has a treble and bass staff. Pno3 has a treble and bass staff. The score includes various notes, rests, and dynamic markings like accents and slurs.

94

The musical score consists of three systems, each for a different piano part (Pno1, Pno2, and Pno3). Each system contains three staves: a treble clef staff, a middle treble clef staff, and a bass clef staff. The time signature is 3/32. Measure 94 is indicated at the top left. Pno1 starts with a whole rest in the treble and bass staves, and a half note in the middle staff. Pno2 starts with a half note in the treble, a half note in the middle, and a half note in the bass. Pno3 starts with a whole rest in the treble, a half note in the middle, and a half note in the bass. The score includes various musical notations such as rests, notes, slurs, and dynamic markings.

Pno1

Pno2

Pno3

Pno1

95

*p*

*p*

6:7

4:5

4:5

Pno2

*p*

*p*

6:7

4:5

4:5

Pno3

*p*

*p*

6:7

4:5

96

Pno1

Pno2

Pno3

4:5

10:11

4:5

7:8

*p*

*p*

*p*

*p*

97 51

Pno1

Pno2

Pno3

18/32 18/32 18/32 18/32 13/32 13/32 13/32 13/32

6:7 4:5 12:13 12:13 4:5 12:13



99

Pno1

17/32

6:7

4:5

4:5

Pno2

17/32

6:7

4:5

Pno3

17/32

4:5

4:5



103

Pno1

31/32

10:11

4:5

4:5

Pno2

31/32

10:11

4:5

4:5

Pno3

31/32

10:11

4:5

104

Pno1

16:17

Pno2

Pno3

10:11

16:17

105

Pno1

Pno2

Pno3

106

Pno1

Pno2

Pno3

4:5

10:11

10:11

7:8

10:11

107

Pno1

Pno2

Pno3

The musical score is divided into three systems, each for a different piano (Pno1, Pno2, Pno3). Each system contains four staves (two treble and two bass clefs). The time signature is 18/32. Measure 107 is marked at the beginning of the first system. The score includes various musical notations such as notes, rests, and dynamic markings. Specific markings include '6:7' in the first system, '4:5' and '12:13' in the third system, and a '13' marking at the start of the second measure in each system. The notation is dense and complex, typical of a contemporary piano work.

109

Pno1

30/32

6:7

4:5

Pno2

30/32

4:5

Pno3

30/32



110

Pno1

Pno2

Pno3

*III*

Pno1

Pno2

Pno3

112

Pno1

Pno2

Pno3

113

Pno1

Pno2

Pno3

114

Pno2

*f*

6:7

*f*

3:3

5:4



115

Pno1

*p*

6:7

6:7

10:11

6:7

6:7

*p*

Pno2

*p*

Pno3

116

Pno1

Pno2

Pno3

117

Pno1

Pno2

Pno3

The musical score is for three pianos (Pno1, Pno2, Pno3) in 5/4 time. The key signature has one flat (B-flat). The score begins at measure 117. Pno1 has a treble clef and a bass clef. Pno2 has a treble clef and a bass clef. Pno3 has a treble clef and a bass clef. The score includes various musical notations such as notes, rests, and dynamic markings like 'f' and '3:2'. There are also some unusual markings like '6:7' and '3:2' which might be related to the time signature or specific rhythmic patterns.

118

*p* *f*

Pno1

*mp* *mp*

6:7 10:11

Pno2

6:7 10:11

*mp*

Pno3

*mp*

10:11



119

Pno1

Pno2

Pno3

*f*

*mp*

*p*

3:2

*p*

*p*

*p*

121 69

Pno1

Pno2

Pno3

3/32 3/32 18/32 18/32

*pp* *pp* *pp* *pp* *pp* *pp* *pp* *pp*

Ride the Cosmos

123

Pno1

Pno2

Pno3



124

Pno1

Pno2

Pno3

125

Pno1

Pno2

Pno3

71

127

Pno1

Pno2

Pno3

128

Pno1

Pno2

Pno3

129

Pno1

Pno2

Pno3

130

Pno1

Pno2

Pno3



131

Pno3

Pno3

132

33

29

25:16

29



133

**Pno1**

**Pno2**

**Pno3**

*mp* *10:7* *mp* *10:7*

*p*

*p*

*mp* *10:7* *mp* *10:7*

*p*

*mf* *10:7* *mf* *10:7* *mp*

*mp*

*mp*

135  $\text{♩} = 111$   $\text{♩} = 100$  77

Pno1

Pno2

Pno3

The score is divided into three systems, each for a piano (Pno1, Pno2, Pno3). Each system contains five staves (treble and bass clefs). The first system (Pno1) starts at measure 135 with a tempo of 111. The second system (Pno2) starts at measure 255 with a tempo of 100. The third system (Pno3) starts at measure 325 with a tempo of 100. The score includes various dynamic markings such as *mf*, *p*, and *mp*, and features complex rhythmic patterns with many beamed notes and rests. A 10:7 ratio is indicated in several places, likely representing a specific rhythmic interval or a performance instruction.

137

Pno1

10:7

*p*

Pno2

10:7

*p*

Pno3

10:7

*p*

139

Pno1

Pno2

Pno3

140  $\text{♩} = 100$

Pno1

mf mp

mf mp

22:13

mp 5

mp

Pno2

mp

5 13

mp

9

mp 5:3

mp

140  $\text{♩} = 100$

Pno3

mp

22:13

141

Pno1

mf

22:13

mp

Pno2

mf

22:13

5

Pno3

mf

22:13

13

9

mp

5

5:3

The musical score is divided into three systems, each for a different piano (Pno1, Pno2, Pno3). Each system contains two staves (treble and bass clef). The first system (Pno1) starts at measure 142 and ends at measure 111. The second system (Pno2) also starts at measure 142 and ends at measure 111. The third system (Pno3) starts at measure 142 and ends at measure 111. The score includes dynamic markings such as *mf*, *f*, *p*, and *mp*. Performance instructions include *22:13* and *5*. The tempo is marked as  $\text{♩} = 111$ . The key signature is one flat (B-flat).

144 ♩ = 100

Pno1

Pno2

♩ = 100

Pno3



145

Pno1

Pno2

Pno3

13:10

11:10

5:3

mf

5

13:10

11:10

mf

3

7

mp

5:4

13:10

mp

20:11

11:10

3

7

mp

146

Pno1

mf 13:11

10:11

mf 12:11

3:2

Pno2

13:11

10:11

12:11

Pno3

mp 12:11

mf 13:11

10:11

mp

mf 12:11

3:2

147 ♩ = 111

**Pno1**

**Pno2**

**Pno3**

*f* *mp* *p* *mf* *f* *p* *mf* *mf*

148 ♩ = 100

Pno1

Musical score for Pno1, measures 148-151. The score consists of four staves. The top two staves are in treble clef with a 3/32 time signature. The bottom two staves are in bass clef with a 3/32 time signature. The music features complex rhythmic patterns with many beamed notes. Dynamic markings include *p* (piano) and *mf* (mezzo-forte). The tempo is marked as ♩ = 100. There are two instances of the ratio "18:11" written below the notes in the second and third staves.

Pno2

Musical score for Pno2, measures 148-151. The score consists of four staves. The top two staves are in treble clef with a 3/32 time signature. The bottom two staves are in bass clef with a 3/32 time signature. The music features complex rhythmic patterns with many beamed notes. Dynamic markings include *mf* (mezzo-forte) and *mp* (mezzo-piano). The tempo is marked as ♩ = 100. There is one instance of the ratio "18:11" written below the notes in the second staff.

Pno3

Musical score for Pno3, measures 148-151. The score consists of a single staff in bass clef with a 3/32 time signature. The music features long, sustained notes with a slur. The dynamic marking is *p* (piano). The tempo is marked as ♩ = 100.

149

♩ = 100

Pno1

Musical score for Pno1, measures 149-152. The score is written in 3/32 time, with a key signature of one flat (B-flat). It consists of four staves. The first two staves are treble clef, and the last two are bass clef. The piece starts at measure 149 with a tempo of 100. The first staff has dynamics *p* and *pp* for a five-measure phrase, followed by *mf* for an eight-measure phrase. The second staff has dynamics *p* and *pp* for a five-measure phrase, followed by *mf* for an eight-measure phrase. The third staff has dynamics *mf* for two measures. The fourth staff has dynamics *mf* for two measures. The piece ends at measure 152.

Pno2

Musical score for Pno2, measures 149-152. The score is written in 3/32 time, with a key signature of one flat (B-flat). It consists of three staves. The first two staves are treble clef, and the last is bass clef. The piece starts at measure 149 with a tempo of 100. The first staff has dynamics *p* and *pp* for a five-measure phrase, followed by *mf* for an eight-measure phrase. The second staff has dynamics *mf* for an eight-measure phrase. The third staff has dynamics *mf* for two measures. The piece ends at measure 152.

Pno3

Musical score for Pno3, measures 149-152. The score is written in 3/32 time, with a key signature of one flat (B-flat). It consists of four staves. The first two staves are treble clef, and the last two are bass clef. The piece starts at measure 149 with a tempo of 100. The first staff has dynamics *mf* for two measures. The second staff has dynamics *mf* for an eight-measure phrase. The third staff has dynamics *mf* for two measures. The fourth staff has dynamics *mf* for two measures. The piece ends at measure 152.

151

Pno1

Musical score for Pno1, measures 151-153. It consists of four staves: two treble clefs and two bass clefs. The music features a steady eighth-note accompaniment in the bass and a melody in the treble. Dynamics are marked *mf*.

Pno2

Musical score for Pno2, measures 151-153. It consists of three staves: two treble clefs and one bass clef. The music is mostly silent in the first two measures, with activity starting in the third measure. Dynamics are marked *mf*.

Pno3

Musical score for Pno3, measures 151-153. It consists of four staves: two treble clefs and two bass clefs. The music features a steady eighth-note accompaniment in the bass and a melody in the treble. Dynamics are marked *mf*.

153 rit. . . . .

Pno1

Pno2

rit. . . . . ♩ = 38 ♩ = 100

Pno3

155

The musical score is divided into three systems, each for a different piano part:

- Pno1:** Features a complex rhythmic pattern with eighth and sixteenth notes, often beamed together. It includes dynamic markings such as *mf* and *mf*.
- Pno2:** Shows a more sparse texture with fewer notes, including some rests and occasional chords. It features dynamic markings like *mf*.
- Pno3:** Contains a dense, rhythmic accompaniment with many beamed notes, characteristic of a piano accompaniment. It includes dynamic markings like *mf*.

The score is written in a key signature of one flat (Bb) and a time signature of 4/4. The notation includes various musical symbols such as stems, beams, slurs, and dynamic markings.



157 *rit.*  $\text{♩} = 38$

Pno1

Pno2



160

Pno1

Pno2

Pno3

The musical score is divided into three systems, each for a different piano (Pno1, Pno2, Pno3). Each system contains four staves. The time signature is 20/32. The score begins at measure 160. Pno1's part includes a treble clef staff with a whole rest and a bass clef staff with a whole note chord. Pno2's part features a treble clef staff with a whole note chord and a bass clef staff with a whole note chord. Pno3's part has a treble clef staff with a whole note chord, a middle staff with a melodic line, and a bass clef staff with a whole note chord. Dynamics are marked with 'f' (forte) and 'p' (piano). A key signature change to one flat is shown in the Pno3 part.

161

Pno1

Pno2

Pno3

162

Pno1

*mp*

*mp*

*mp*

Pno2

*mp*

*mp*

*mp*

Pno3

*mp*

*mp*

*mp*

163

Pno1

Pno2

Pno3

The musical score is divided into three systems, each for a different piano (Pno1, Pno2, Pno3). Each system consists of two staves (treble and bass clef). The time signature is 3/32. Measure 163 is indicated at the top left. Pno1 features a complex rhythmic pattern in the right hand with many beamed notes and a dynamic marking of *p*. Pno2 has a more melodic line in the right hand with a long note and a dynamic marking of *p*. Pno3 has a simpler melodic line in the right hand. The score includes various musical notations such as notes, rests, and dynamics.

164

Pno1

Pno3

*p* 6:5 6:5 8:7

*p* 8:7 6:5 8:7 8:7



166

Pno1

Pno3

8:7 6:5

6:5 6:5

167

Pno3

8:7 8:7 8:7 8:7 8:7 8:7 8:7 8:7



169

$\text{♩} = 140$

Pno1

*p* *p* *p*

Pno2

*p* *p*

$\text{♩} = 140$

Pno3

*p*



172

The musical score consists of three systems, each for a different piano part (Pno1, Pno2, Pno3). Each system contains two staves (treble and bass). The first measure of each system shows rests in the treble clef and notes in the bass clef. The second measure features a change in time signature to 9/16 and includes a piano (*p*) dynamic marking. Pno1 has a five-fingered (*5*) melodic line in the treble clef. Pno2 has a complex melodic line in the treble clef with a 3:2 ratio marking and a sustained chord in the bass clef. Pno3 has a melodic line in the treble clef and a sustained chord in the bass clef. The third measure of each system returns to a 11/16 time signature and continues the melodic and harmonic development.

175

Pno1

Pno2

Pno3

7:5

7:5

7:5

*p*

*p*

*p*

102

177

Pno1

Pno2

Pno3

The musical score is for three pianos (Pno1, Pno2, Pno3) in 11/16 time. It begins at measure 102 and continues to measure 177. The score is organized into two systems. Each piano part consists of three staves. Pno1 and Pno2 have very similar parts, with Pno1's bass line featuring a prominent sustained chord. Pno3's part is more intricate, featuring many rests and specific melodic fragments in the upper staves, while the bass line has a steady rhythmic pattern. Dynamics are marked as piano (p) throughout. The notation includes various note values, rests, and articulation marks like accents and slurs.

179

Pno1

Pno2

Pno3

3/32 2/4 11/16

*p*

*p*

*p*

5

5

7:5

104

182

Pno1

Pno2

Pno3

184

Pno1

Pno2

Pno3

185 ♩ = 110

Pno1

Pno2

Pno3

187

Pno1

Pno2

Pno3

5:3

7:5

5:3

7:5

5:3

5:3

7:5

5:3

190

Pno1

Pno2

Pno3



108 192

Musical score for measures 108-192, featuring three piano parts (Pno1, Pno2, Pno3) in 11/16 time. The score is divided into two systems. The first system (measures 108-192) shows Pno1 with complex rhythmic patterns and intervals of 5:3 and 5:3. Pno2 has intervals of 5:3 and 7:5. Pno3 has intervals of 5:3 and 7:5. The second system (measures 193-194) shows Pno1 with a 7-measure interval, Pno2 with a 7-measure interval, and Pno3 with a 7-measure interval. The score includes various musical notations such as notes, rests, and slurs.



Musical score for measures 194-277, featuring three piano parts (Pno1, Pno2, Pno3) in 27/16 time. The score is divided into two systems. The first system (measures 194-277) shows Pno1 with a 7-measure interval, Pno2 with a 7-measure interval, and Pno3 with a 7-measure interval. The second system (measures 278-279) shows Pno1 with a 7-measure interval, Pno2 with a 7-measure interval, and Pno3 with a 7-measure interval. The score includes various musical notations such as notes, rests, and slurs.

*Ride the Cosmos*

195

Musical score for measures 195-196. The score is for three pianos (Pno1, Pno2, Pno3) in a 3/32 time signature. Pno1 has a treble clef and a 3/32 time signature. Pno2 has a treble clef and a 3/32 time signature. Pno3 has a bass clef and a 3/32 time signature. Measure 195: Pno1 has a whole rest followed by a quarter rest, then a quarter note G#4, and a quarter note A4. Pno2 has a whole rest followed by a quarter rest, then a quarter note G#4, and a quarter note A4. Pno3 has a whole rest followed by a quarter rest, then a quarter note G#4, and a quarter note A4. Measure 196: Pno1 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno2 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno3 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. There are various ornaments and slurs throughout the score.

Pno1

Pno2



196

Musical score for measures 196-197. The score is for three pianos (Pno1, Pno2, Pno3) in a 3/32 time signature. Pno1 has a treble clef and a 3/32 time signature. Pno2 has a treble clef and a 3/32 time signature. Pno3 has a bass clef and a 3/32 time signature. Measure 196: Pno1 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno2 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno3 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Measure 197: Pno1 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno2 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. Pno3 has a quarter note G#4, a quarter note A4, a quarter note B4, and a quarter note C5. There are various ornaments and slurs throughout the score.

Pno1

Pno2

Pno3

197

Pno1

Pno2

Pno3

9:5

9:5

8:5

3:2

9:5

198

Pno1

Pno2

Pno3

7

3

7

7

3

7:5

3:2

200 rit. . . . . ♩ = 80 ♩ = 140

Pno1

Pno2

Pno3

Detailed description: This system contains measures 200 to 216. It features three piano parts. Pno1 starts with a half note chord in the right hand and a half note chord in the left hand, both tied across the bar line. Pno2 has a quarter note chord in the right hand and a half note chord in the left hand, both tied across the bar line. Pno3 has a quarter note chord in the right hand and a half note chord in the left hand, both tied across the bar line. At measure 216, the tempo changes from 80 to 140. Pno1 and Pno2 have a piano (p) dynamic. Pno3 has a piano (p) dynamic.



202

Pno1

Pno2

Pno3

Detailed description: This system contains measures 202 to 216. It features three piano parts. Pno1 has a quarter note chord in the right hand and a half note chord in the left hand, both tied across the bar line. Pno2 has a quarter note chord in the right hand and a half note chord in the left hand, both tied across the bar line. Pno3 has a quarter note chord in the right hand and a half note chord in the left hand, both tied across the bar line. At measure 216, the tempo changes from 80 to 140. Pno1 and Pno2 have a mezzo-forte (mp) dynamic. Pno3 has a mezzo-forte (mp) dynamic.

205

Pno1

Pno2

Pno3

*mf*

*f*

*ff*

*fff*

*p*

*mf*

*mf*

208

Pno1

Pno2

Pno3

*p*

*p*

*p*

7:5

7:5

7:5

8:5 3:2

*p*

*p*

*p*

*p*



210

Pno1

Pno2

Pno3

*f* *pp* *pp* *pp* *pp*

23 20 20 23

Oct. 21, 2016 - July 12, 2017  
Germantown, NY