

JOCELYN HEARS THE STARS

AD HONOREM
JOCELYN BELL BURNELL

JORDAN ALEXANDER KEY

© 2021

JORDAN ALEXANDER KEY

JOCELYN HEARS THE STARS

FOR

FORMOSA DUO

Violoncello – Piano

April, 2021

About Jocelyn Bell Burnell:

Dr. Dame Susan Jocelyn Bell Burnell (b. 1943) is a British astrophysicist from Northern Ireland who, as a postgraduate student in 1967, discovered the first radio pulsars. The discovery was recognized by the award of the 1974 Nobel Prize in Physics but, despite being the first person to discover the pulsars, she was not one of the recipients of the prize.

The paper announcing the discovery of pulsars had five authors. Bell's thesis supervisor Antony Hewish was listed first, Bell Burnell second. Hewish was awarded the Nobel Prize, along with the astronomer Martin Ryle. While many prominent astronomers criticized Burnell's omission from the Nobel Prize, she played down this controversy, saying, "I believe it would demean Nobel Prizes if they were awarded to research students, except in very exceptional cases, and I do not believe this is one of them." The Royal Swedish Academy of Sciences, in its press release announcing the 1974 Nobel Prize in Physics, cited Ryle and Hewish for their pioneering work in radio-astronomy, with particular mention of Ryle's work on aperture-synthesis technique, and Hewish's decisive role in the discovery of pulsars. Nothing was said of Burnell's critical work and pivotal discovery, upon which her advisors', Ryle's and Hewish's, research was unquestionably founded.

That Bell did not receive recognition in the 1974 Nobel Prize in Physics has been a point of controversy ever since. She helped build the Interplanetary Scintillation Array over two years and initially noticed the anomaly, sometimes reviewing as much as 96 feet (29 m) of paper data per night. Bell later said that she had to be persistent in reporting the anomaly in the face of skepticism from Hewish, who was initially insistent that it was due to man-made radio interference.

Bell Burnell is currently Visiting Professor of Astrophysics at the University of Oxford, and a Fellow of Mansfield College. She was President of the Institute of Physics between 2008 and 2010. In February 2018 she was appointed Chancellor of the University of Dundee. In 2018, Bell Burnell was awarded the Special Breakthrough Prize in Fundamental Physics, worth three million dollars (£2.3 million), for her discovery of radio pulsars. She donated all of the money "to fund women, under-represented ethnic minority, and refugee students [seeking] to become physics researchers." These funds are to be administered by the Institute of Physics under the "Bell Burnell Graduate Scholarship Fund."

Note on Magnetic Tape Technique:

The tape technique first involves the pianist acquiring two to three feet of magnetic tape (like that found in cassette or VHS tapes – the composer recommends the thicker tape of a VHS, but either will suffice). If the pianist requires, the composer can be contacted for magnetic tape, though blank reels of tape can be easily purchased very cheaply online.

This tape will then be secured to the indicated string by gently tying the tape around the string. While the tape can be tied anywhere to the string's resonating length, the primary nodes are recommended (1st, 2nd, or 3rd partials). For this work, you will need to attach tapes to the lowest B string only. The loose end of the tape can either be tied (or taped - recommended) to the upper end of the piano's lid support peg (creating approximately a 45-degree angle against the piano's horizontal plane). The tape should be quite taut.

While depressing the sustain pedal, the pianist will run their fingers across the tape from the low end (near the strings) to the upper end. This should be a relatively slow and continuous motion with medium to heavy pressure on the tape (taking care not to unduly stretch or break the tape). The performer is encouraged to find their best grip, but the composer offers these suggestions:

- 1 One side of the tape is often more frictional. It is to this side that the most pressure should be applied.
- 2 The effectiveness of the technique is sometimes determined by the oil consistency on the hands. Often the technique is more difficult to execute after one wash their hands.
- 3 It might be helpful to apply counter torsion pressure by pushing down on the tape with the index and/or middle finger while also applying upward pressure with the thumb, but slightly offset from the index/middle fingers.
- 4 More pressure will produce a fuller sound, but too much pressure will slowly stretch the tape, making it more difficult to work with over the course of the rehearsal/performance. The tape works best when taut. Should the tape be affixed to the peg and become loose in a performance due to stretching, one can use the free right hand (assuming it is free) to reign in the slack of the tape.
- 5 The tape can also be stroked from top-to-bottom as well as from bottom-to-top. Starting at the top will produce a more whiney timbre at the outset of the sound and move towards a broader low-pitched resonant sound, whereas the reverse is true should the tape be stroked bottom-to-top. One can execute the technique with a continuous motion from bottom-top-bottom, but this may take some practice to satisfactorily execute. The more continuous the sound is over the sound's required duration the better. However, if one needs to start and stop, following a bottom-top + bottom-top motion, this is fine.

Have fun and experiment with the technique to find the sound that you like most within the sound world of this magnetic tape and the piano. This should sound somewhat like a sitar with extra whininess.

Jocelyn Hears the Stars

Ad Honorem Jocelyn Bell Burnell

Jordan Alexander Key
April 2021

PIANO NOTE: At this sign \oplus

These tones keep off the damper by the middle-pedal (sostenuto-pedal) until the end of this piece.

8^{vb}

afix magnetic tape to lowest B-string and tie/tape loose end of tape to the piano lid/lid-support.

Chasmous (♩ = ca. 40)

absolutely mechanical, gentle pulse, not too short

Violoncello

Piano

pp

pp

mf

pp

PED. *pp*

8^{va}

4

(8)-----7

ppp

Grab B6 and F#7 with Sos Ped.

pp

like a pristine bell

mf

3 3 3

stacatissimo

8^{vb}

7

3

3

3

8^{va}

9

PED.

c. 15"

A

moving between arco ord. and molto sul pont.
Also fluctuating left hand finger pressure

arco ord.

9

n

pp

mp

pp

c. 15"

with magnetic tape affixed to lowest B-string,
freely stroke magnetic tape, accessing all
harmonics possible (see note).

ff

mp

allow to sustain

PED.

12

mp

p

PED.

touching strings as harmonic and sliding

14

fp
gradually accelerating trem.
fp
mf
p cresc.
p
mf

16

+1 tr
f
p
f
gradually accelerating trill
+1 tr
p
f
p
f
ff

19

pp
ff
mp
begin process of undamping
lowest range of strings
PED.

B

21 *molto sul pont.*
pp < *mp* > *pp*

Ethereal bells, echoing through eternity

8^{va}----- | loco

8^{va}----- | loco

pp *Pianissimo e molto espressivo*

PED.

23 *n pp* *pp* < *mp*

8^{va}----- | loco

(loco)

p

8^{vb}----- | *ppp*

pp

26 *p* *pp* *mp*

8^{vb}----- |

29

p *n*

32

pp *pp* *8va* *8va* *8vb* *ff* *ppp* *ff* *pp* *3* *3* *3* *

C

35

solo, molto espressivo

mp *p* *mf* *pp* *with magnetic tape* *PED.*

Note: this should resonate due to lifted key with Sos. Ped.

38

mf *mp* *mp*

(8)-----
loco
ff
PED. *mp*

4

41

mf *f* *mp*

5

(sound should sustain)

D

44

f *ff* *p*

solo, freely

PED.

rit. A tempo ♩ = 40

46

2/4 4/4

ff loco

8va

13

48

5/8 5/4

p ff

*

50

highest pitch possible, chittering

mp f

8va loco

8va loco

PED.

52

mf

p

53

pp

+1tr

+1tr

8^{vb}

* PED.

E

Double Time ♩ = 80

54

mf

mf

(8)

56

mp

mf

mp

gliss.

8^{va}

*

58

mf

(8)-----loco

f

mp

PED.

60

mp

p

10
62

p *gliss.* *mf* *mp*

This system contains measures 62 through 65. The bass clef part features sixteenth-note chords with sixths, marked *p* and *mf*. A glissando is indicated over the final measure. The treble clef part has a melodic line with slurs and a *mp* dynamic. The piano accompaniment consists of chords with sixths in the right hand and chords with sixths in the left hand.

64

mp *gliss.* *p*

This system contains measures 64 and 65. The bass clef part continues with sixteenth-note chords, marked *mp* and *p*. A glissando is indicated over the final measure. The treble clef part has a melodic line with slurs and a *p* dynamic. The piano accompaniment consists of chords with sixths in the right hand and chords with sixths in the left hand.

66

7 8 7 8 7 8

This system contains measures 66 through 68. The bass clef part features sixteenth-note chords with sixths, marked *p*. The treble clef part has a melodic line with slurs and a *p* dynamic. The piano accompaniment consists of chords with sixths in the right hand and chords with sixths in the left hand. Measure numbers 7, 8, 7, 8, 7, 8 are written at the end of the system.

* PED.

68 11

pp

p

3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4

*

70

p *mp*

pp *p*

3/4 7/8 3/4 3/4 3/4 3/4 3/4 3/4

PED.

*

72

p *mf* *p*

PED.

12 74

pp

pp

76

pp

*

F

A tempo (Half Time; ♩ = 40)

79

p *ff* *loco*

8^{va}

3 *5* *3* *3*

3 *5* *3* *3*

8^{vb}

PED.

80

2/4 3/4 2/4

f *mf*

3 3 3 3 3 3

mp

2/4 3/4 2/4

2/4 3/4 2/4

Detailed description: This system contains measures 80 and 81. Measure 80 is in 2/4 time, starting with a bass clef and a key signature of one sharp (F#). It features a forte (*f*) dynamic and a slur over a quarter note F# and a half note G. Measure 81 is in 3/4 time, starting with a mezzo-forte (*mf*) dynamic. It contains a quarter note F#, a quarter note G, and a quarter note A, with a triplet of eighth notes (G, A, B) marked with a '3'. The system concludes with a 2/4 time signature. The piano accompaniment in the right hand consists of eighth-note triplets in 2/4 time, while the left hand is silent.

82

2/4 3/4 2/4

5 3 3

3 3 3 3

2/4 3/4 2/4

2/4 3/4 2/4

Detailed description: This system contains measures 82 and 83. Measure 82 is in 2/4 time, starting with a bass clef and a key signature of one sharp (F#). It features a quarter note F#, a quarter note G, and a quarter note A, with a quintuplet of eighth notes (G, A, B, C, D) marked with a '5'. Measure 83 is in 3/4 time, starting with a mezzo-forte (*mf*) dynamic. It contains a quarter note F#, a quarter note G, and a quarter note A, with a triplet of eighth notes (G, A, B) marked with a '3'. The system concludes with a 2/4 time signature. The piano accompaniment in the right hand consists of eighth-note triplets in 2/4 time, while the left hand is silent.

84

2/4 3/4 2/4

f

5 3 3

2/4 3/4 2/4

2/4 3/4 2/4

Detailed description: This system contains measures 84 and 85. Measure 84 is in 2/4 time, starting with a bass clef and a key signature of one sharp (F#). It features a quarter note F#, a quarter note G, and a quarter note A, with a quintuplet of eighth notes (G, A, B, C, D) marked with a '5'. Measure 85 is in 3/4 time, starting with a forte (*f*) dynamic. It contains a quarter note F#, a quarter note G, and a quarter note A, with a triplet of eighth notes (G, A, B) marked with a '3'. The system concludes with a 2/4 time signature. The piano accompaniment in the right hand consists of eighth-note triplets in 2/4 time, while the left hand is silent.

85

fp *mf*

86

accel.

fp *cresc.*

ped.

87

ped.

88

approximate sound

seagull effect

f

f

gliss.
(poco accel. - rit.)

15

f cresc.

12 12 12

A tempo

89

gliss.

gliss.

2/4

2/4

2/4

2/4

2/4

2/4

ff

12 12 12

91

8^{va}

ff

*

93

G

(poco accel. - rit.)

highest pitch possible, chittering

gliss.

(seagull-effect)

p

ppp

mp

p

pp

p

PED.

O.V.B.

96

molto sul pont., sliding between pitches

n

mp

pp

gliss interior very softly and freely

glently pluck

(poco accel. - rit.)

100

gliss.

(seagull-effect)

p *ppp* *p* *mp* *p* *mp*

* PED.

103

sul pont.

mf *mp* *pp* *n*

mf *f* *ff* *mp*

*

H

107

pp *mp* *p* *pp*

pp

PED.

110

mp

113

mf *f* *ff*

115

mp *p* *n*

117

pp

pp

3

5/4

3/4

*

I

119

trills: as fast as possible

pp — *ff*

pp — *fff*

pizz.

ff

3/4

3/4

3/4

(piano interior resonating)

(piano interior resonating)

123

arco ord.

ff

ppp — *fff*

2/4

2/4

2/4

125

2/4

ff

f *p*

PED.

127

mf

6

3

3

mp

+1 tr

4/4

mf

129

4/4

9

f *ff* *mf*

pp *ff*

+1 tr

8^{vb}

f

(poco accel. - rit.)

131

gliss.

(seagull-effect)

p *ff*

pp *ff*

6 9 +1tr

p *ff*

8^{Vb}

mp

*

J

134

pp *pp*

pp

pp *cresc.*

3

3

3

8^{Vb}

+1tr

PED.

136

molto sul pont.

(gliss.)

fp

pp cresc.

3 3 3

accel.

137

fp *f*

accel.

3 3 3 3

138

ff *mf* A tempo ♩ = 40

3 3 *ff* A tempo ♩ = 40

K

140

mf *p* (seagull-effect) *gliss.* (poco accel. - rit.)

pp PED.

143

gliss.
ppp

2/4 5/4 3/4

L

146

molto sul pont.
pp

2/4 5/4 3/4

149

arco ord.
p

2/4 5/4 5/4

8^{Vb}

*

152

pp

pp

pp

PED.

154

pp — *ff*

pp — *ff*

pp — *ff*

(piano interior resonating)
recall, sos ped still down.

PED.

M

157

solo, freely expressive

mf

f

mf

8^{va}-----

PED.

159

Musical score for measures 159-160, measures 160-161, and measure 161. The score is written for a grand staff (treble and bass clefs) and a separate bass line. Measure 159 features a *loco* marking and a dynamic of *mp*. Measure 160 includes dynamics of *p*, *mf*, and *f*, along with a *9* fingering. Measure 161 has a dynamic of *mf*. The time signature is 6/4.

160

Musical score for measures 160-161 and measure 161. The score is written for a grand staff (treble and bass clefs) and a separate bass line. Measure 160 includes dynamics of *p*, *mf*, and *f*, along with a *9* fingering. Measure 161 has a dynamic of *mf*. The time signature is 6/4.

*

N

161

Musical score for measure 161. The score is written for a grand staff (treble and bass clefs) and a separate bass line. Measure 161 has a dynamic of *mf*. The time signature is 11/32. The score includes a *loco* marking and a *8^{va}* marking. The word *PED.* is written below the grand staff.

164

Musical score for measures 164-166. Measure 164 is a single bass clef line with a 5/4 time signature. Measures 165-166 are grand staff notation with a 5/4 time signature. A dashed line labeled (8) spans measures 165-166.

freely, very expressive

167

Musical score for measures 167-169. Measure 167 is a single bass clef line with a 5/4 time signature and dynamic markings *f*, *mf*, *f*, *mf*, *f*, *mf*, *f*. Measures 168-169 are grand staff notation with a 5/4 time signature and dynamic markings *pp*, *cresc.* Fingerings 6 and 9 are indicated.

170

Musical score for measures 170-171. Measure 170 is a single bass clef line with a 4/4 time signature and dynamic markings *mf*, *ff*, *f*. Measures 171 is grand staff notation with a 4/4 time signature and dynamic markings *f*, *ff*. Fingerings 3, 5, and 9 are indicated.

172

accel.

fff

mp cresc.

3 3 3 3

accel.

173

$\text{♩} = 52$

ff

3 3 3 3

$\text{♩} = 52$

pp

8^{vb}

ff

175

ff

3 3

pp cresc.

* PED.

177 Begin playing "seagull effect" freely; improvisatory, varying speed, direction, pressure, dynamic, etc.

accel.

Musical score for measures 177-180. The score is written for a grand staff (treble and bass clefs). The right hand (treble clef) contains rests with a repeat sign (⌋) in measures 177 and 178. The left hand (bass clef) features a rhythmic pattern of eighth notes with a triplet bracket over every three notes. The dynamics are marked *p* (piano) at the start and *mp* (mezzo-piano) in the second half. The instruction "accel." (accelerando) is written above the staff in the second half.

Musical score for measures 179-180. The right hand (treble clef) contains rests with a repeat sign (⌋) in measures 179 and 180. The left hand (bass clef) continues the rhythmic pattern from the previous system. The dynamics are marked *p* (piano) at the start and *mf* (mezzo-forte) in the second half. The instruction "accel." is also present. The piece concludes with a 3/4 time signature.

Musical score for measures 181-182. The right hand (treble clef) contains rests with a repeat sign (⌋) in measure 181. The left hand (bass clef) continues the rhythmic pattern. The dynamics are marked *ff* (fortissimo) at the start. The piece concludes with a 3/4 time signature.

182 . ♩ = c. 66

As fast as possible while being clear, cascading

♩ = c. 66

p

183

8

f *mp*

184

5

mf *f*

+1 tr *p* *pp* *ff*

3 3 3 3

ff *ff*

* PED.

30

185

(t) *pp* *loco* *ff*

molto sul pont.

0

A tempo ♩ = 40

186 *ff* allow for long decay *pp*

ff *pp* *ff* *p*

+1 tr.

pp *ff* allow for long decay *

8^{vb}

189

8^{vb} (must be audible over tape sound) 8^{vb}

mf *ff* *ff* *mp* *mp*

pp *n*

(poco accel. - rit.)

192

gliss.

freely repeating gesture, vary speed but very quiet

pp
(seagull-effect)

p

(8)-----*loco*-----3-----

mf

194

n

p

8^{va}-----

let decay, if necessary begin gently dampening with hands gently release Sos. Ped.

n