

## Kaija Saariaho: *Petals for Cello Solo and Optional Electronics*

### CD 3 track 8

Kaija Saariaho was born in Helsinki, Finland in 1952 and now lives in Paris. In the 1980s, intrigued by the role computers could play in composing, she researched at the IRCAM (Institute for Research and Coordination in Acoustics/Music) in Paris. There she developed techniques of computer-assisted composition, working on tape and with live electronics. She became known for mixing electronic sounds with classical instruments, creating a seamless connection between the two worlds. This influenced her approach to orchestral writing which has an emphasis on the slow transformation of dense masses of sound in some works, such as *Verblendungen* (1984). Her varied output has included works for ensembles, orchestra, opera houses, electronics and soloists. Her first opera *L'Amour de Loin* (*Love From Afar*) debuted in Salzburg in 2000 and was a huge success.

Saariaho has a distinct and original voice; her music is marked by its sometimes celestial atmosphere where **timbre** and colours are central. Some of her compositions can be described as **spectralist**, a style of music pioneered by Gérard Grisey (1946–1998) and Tristan Murail (b. 1947). Murail once wrote that the initial motivation of the spectralists was 'to control the finest possible degrees of change'. Spectral music is based on the computer analysis of the sound-spectrum. It focuses on the manipulation of the spectral features of sound and the potential of the **harmonic series** (or overtone series). This analytical approach led to Saariaho's use of detailed notation which uses **harmonics, microintervals** and a subtle continuum of sound extending from pure tone to unpitched noise.

*Petals for Cello Solo and Optional Electronics* (1988) takes its musical material from Saariaho's *Nymphéa* (*Waterlily*) for string quartet and electronics (1987), a piece inspired by the *Nymphéas* series of artworks by the Impressionist artist Monet. It could be described as a spectral soundscape.

### Following the score

The score of *Petals* has parts for cello and electronics. R stands for **reverb** and H stands for **harmonizer**. 'Harmonization' alters the frequency of a signal thus changing the pitch, whereas reverb is an effect whereby the sound is made to reverberate slightly, something akin to an echo.

There are no bar lines but each staff is numbered. The cello part uses the bass, tenor and treble clefs and includes numerous instructions and expression marks. Some of these are new and are explained in the score. Wedge-shaped markings above the staff (for example, see staves 2–3) are an indication to apply additional bow pressure, which results in gradual transitions in and out of noise. Individual notes are transformed through timbral and pitch-based manipulations including **glissandi, vibrato** (see staff 3), and **harmonics** (marked by the use of diamond-shaped note heads, see staff 9).

Saariaho's research into new timbres led to the use of **extended techniques** which expand the palette of sound available. Much use is made of ***sul tasto*** and ***sul ponticello***. *Sul tasto* (S.T.) is where the string is bowed near or above the fingerboard, producing an ethereal sound. *Sul ponticello* (S.P.) is where the string is played near or above the bridge, producing high overtones. Both appear for the first time on stave 2. Normal bowing is marked by N. and cancels the previous instruction.

Notice the use of **indeterminacy**. With indeterminate music there is often much that cannot be predicted before performance. In *Petals* certain decisions have been left to the performer, including the opening instruction to play 'very slowly: the duration of every stave in this tempo should always be at least 20"'. At the same time the cello sound is modified through live electronic manipulation – harmonization and reverb. This kind of indeterminacy means that every performance will be different.

The emphasis in *Petals* is on the sonic range explored rather than melody or harmony. The piece is made up of shifting soundscapes and much of the focus is on timbre. A single note is made up of the fundamental note plus quieter frequency resonances or overtones. The timbre is partly determined by the relative strength of these overtones which can be altered by different ways of playing, such as changes in bow pressure, dynamics, and bowing techniques. The overtones (or harmonics) can be produced separately on string instruments by touching the string lightly at various points and producing glassy high notes of flute-like purity.

Microintervals, raising and lowering a note by a quarter tone, are created both by the cello (as frequently happens in staves 4 and 5) and the harmonizer through **pitch shifting** (see stave 2, 50%). Although C is the primary pitch focus (see staves 14–28) and the harmony changes and evolves gradually from stave 13, there is no clear harmonic goal as would be found in **functional harmony**.

### What to listen for

- Listen to the opening staves 1–7. Describe the use of dynamics and microtonality.
- Describe the role that rhythm plays in *Petals*.
- Listen to the final Lento section (beginning at stave 27). Describe the electronic effects and playing techniques used.

### Wider listening

Listen to further works from the 20th and 21st centuries which create new sound worlds. In the mid 1950s Karlheinz Stockhausen integrated electronic sounds with the human voice in his classic early electronic piece *Gesang der Jünglinge*.

## Prelims to *Petals*

When vibrato markings are not specified, players can use their usual vibrato.  
*Molto vibrato* always means a rapid and narrow vibrato, unless otherwise specified.  
 Tremolo should always be as dense as possible.

## General marks

 change very gradually from one sound or one way of playing (etc.) to another

 **diminuendo al niente**

 **crescendo da niente**

S.V. senza vibrato

▲ highest note possible

## Microintervals

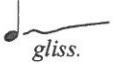
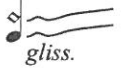
† note raised a  $\frac{1}{4}$  tone (between ♯ and # upwards)


‡ note lowered a  $\frac{1}{4}$  tone (between ♯ and # downwards)

## Glissandi

For glissandi there are three different notations:

 or  this glissando should always be played very evenly, without vibrato and accentuations

 or  glissando with much vibrato


 glissando with artificial harmonics, in which the upper finger is constantly moving and thus creating a rich sound with vividly varying pitches, instead of one gliding pitch


All the glissandi should be started immediately at the beginning of the note value.


S.P. *always* estremamente sul ponticello

S.T. sul tasto


N normal (used with S.P. and S.T., otherwise ord.)


 move gradually from normal to harmonic sound (less and less pressure with the left hand)

 add bow pressure to produce a scratching sound, in which the audible pitch is totally replaced by the noise

 as above but move back from noise to tone again

 E.F. decrease bow pressure to produce a soft, noisy, wind-like murmur

 E.F. decrease bow pressure to produce a soft, noisy, wind-like murmur for as long as E.F. (**estremamente flautando**) continues, and then move gradually back to normal bow pressure

 E.F. add bow pressure to produce a scratching sound, and decrease it gradually to produce the E.F. sound described above.

When playing long sustained tones the bow changes should always be made imperceptible.

## Electronic version

For the electronic version the following are needed:

- at least one microphone for the amplification
- digital reverb with a variable reverb time
- harmonizer (Yamaha SPX90 or REV5: pitch change program, or possibly Publison, Eventide)
- at least two loudspeakers (possibly a monitor for the cellist)
- mixer (suggested set-up shown below).

The amplified sound is sent to both loudspeakers. The amount of amplification depends, naturally, on the concert space, but should not totally cover the acoustic sound of the instrument. The general level should not grow enormously when the degree of effects is added; here the straight amplified sound can be set slightly down. Nevertheless, no abrupt changes in the sound image should be made. The sound ideal is a clear and rich 'close sound'. The microphone(s) should be placed as close to the instrument as possible. The general level should be set to be rather loud, nevertheless not painfully so!

## Harmonizer

The harmonizer should be set to produce microtonal pitch shifting, the transposition being about 50 cents (= ¼ tone) on both sides of the input signal. If only one channel is available, the transposition is set one ¼ tone higher. If the SPX90 is used as harmonizer, select programme 22 (pitch change B) and set the parameters as follows:

- Pitch1 +0/fine1 +45/delay1 20ms
- Pitch2 +0/fine2 -50/delay2 15ms

If some other devices are used, a slight reverb can be added to soften the effect.

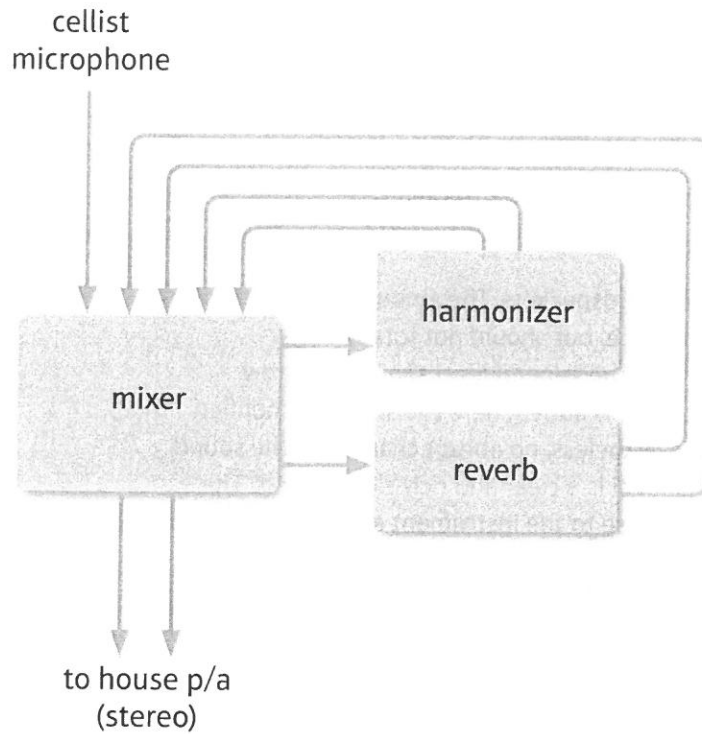
## Reverb

If several reverb programs are available a bright reverberation should be selected without any other effects. At the beginning the reverb time should be set to about 2.5 seconds (depending on the hall), and possible filterings and other manipulations made to obtain a clear and bright sound. If the concert space is very dry, the instrumental sound can be slightly reverberated throughout the piece. If the changing of reverberation time causes any clicks, it is better to choose a stable reverberation and accentuate the changes of reverb time by changing the amount of reverb. Generally: rather too little than too much reverb!

## The notation of the electronics

The two effects are marked with R (reverb) and H (harmonizer). The changes in the degrees of the effects are marked approximately with crescendos or diminuendos from a previous level to a new level, or with dotted lines, which means that the current level is to be maintained. The percentages marked are guidelines only, and will have to be adjusted every time depending on the performance space.

### Proposition for the set-up of the electronics



If SPX90 is used as harmonizer, select programme 22 (pitch change B) and set the parameters as follows:

- pitch1 +0/ fine1 +45/ delay1 20ms
- pitch2 +0/ fine2 -50/ delay2 15ms

**Lento** (very slowly: the duration of every stave in this tempo should always be at least 20"!)

S.P. *very slow bow* *gliss.*

Vlc. *mp*

sul D *mp*

R  $\phi$  40% *rev. time ca. 2.5"*

2 S.P. *gliss.* *mp* *mf*

R (40%)

H  $\phi$  50%

3 *molto vibrato* *more frequent bow changes* S.T. *S.V.* S.P. *tremolo: as dense as poss.* *rit.*

*mf* *ff* *f*

R (40%)

H (50%)

4 (S.P.)  $\downarrow = c.60$  *energico* S.P. *N*

*ff* 10 *ff* 10 *mf* 10 *mf* 10

R (40%)

5 N *S.T.* S.P. *N*

*mf* 10 *mf* 10 *p* *mf* 10 *mp* 10

R (40%)

6 N *S.T.* S.P. *S.T.* S.P. *S.T.*

*mp* 10 *p* *mf* 10 *pp* *f* 10 *mf*

R (40%)



7 S.T. **10** gliss. gliss. S.T. *rit.* ..... *molto* S.P. gliss. move as imperceptibly as poss. from trem. to trill **ppp**

(sul A) **mf**

R (40%)

8 **Lento** S.P. *dolce* very slow bow S.P. → S.T. S.T. → S.P. *ppp* *pp* (less and less pressure with the left hand) *ppp*

R (40%)

H  $\phi$  50% 30%

9 S.P. *sempre dolce* E.F. (ord.) S.P. → S.T. *ppp* *tr*

R (40%) 30%

H 30%  $\phi$

10  $\text{♩} = c. 54$  *espressivo* N → S.P. N → S.P. N → S.P. *accel.* ..... *poco*  $\text{♩} = c. 66$  *leggiero* *mp* *mp* *mp* *mf* *mf* *pp* *f*

R 30%

11 S.P. *poco agitato*  $\text{♩} = \text{♩}$  S.P. → S.T. N *calando* *rit. poco* ..... *a tempo* *p* *f* *mf* *ff* *p* *f* *p* *f*

R (30%)

H  $\phi$  50%  $\phi$

*rit.* ..... *a tempo* *rit.* ..... *a tempo* *rit.* ..... *a tempo*

S.P. → N → S.P. → S.P. → N

*gliss.* *espr.* *gliss.* *gliss.* *gliss.* *gliss.*

*p* ————— *mf* *p* ————— *mf* > *p* ————— *mf* ————— *pp* < *mf* ————— *pp* *mf*

12

3 5 7

R (30%)

*rit.* ..... *molto* ..... ♩ = c. 40 ————— **Lento** (as before, *senza tempo*) *sempre legatissimo*

N → S.P. → S.P. → S.T. → S.P.

*dolce* *very slow bow*

*mf* ————— *pp* ————— *pp* *pp* *pp*

3 5

(sul G) (sul D)

at least 12"

13

R 30% ————— 50%

S.P. → S.T. → S.P. → S.T. → S.P. → S.T.

*calmato* *pp* *pp* *pp* *pp* *pp*

14

15

R 50%

H φ ————— φ < 20% > φ

S.T. → S.P. → S.T. → S.P.

*pp* *pp* *pp* *mp*

*gliss.* *tr* *tr*

15

16

R (50%) ————— 40%

H φ ————— 20% ————— φ

S.P. → E.F. → S.T.

*ppp* *mf*

*gliss.* *tr* *tr*

(more and more pressure with the left hand)

16

17

R 40%

H φ ————— 50% ————— φ

\* sul G



*poco impetuoso*  
 (♩ = c. 60)  
 17 (N) *p* *mf* *p* *mf* *mp* *f* *tr*

N → S.P. N → S.P. N → S.P. N → S.P. rit. S.P. *mf*

*mp* *mp* *gliss.* *gliss.* *f* *6* *6*

R (40%) 20%

*poco rubato*  
 18 *mf* *p* *f* *pp* *f* *ppp* *gliss.*

rit. S.P. N N → S.T. *a tempo* S.T. S.P. S.T. S.P. *f* *pp*

*gliss.* *6* *6* *5* *at least 10"*

R 20% 40% 20% 40% 20%

H φ 30% φ

(less and less pressure with the left hand)

*a tempo, intenso*  
 19 S.P. S.T. S.P. S.T. *poco rit.* S.T. S.P. *gliss.* *pp*

*f sempre* (sul D)

R 20% 40% 20%

H φ 20% φ

*a tempo* *rit.* *poco* *a tempo* *rit.* *poco*  
 20 S.T. S.T. S.P. S.T. S.T. S.P. *gliss.* *gliss.*

*ppp* *f* *ppp* *ff* *p*

R 20% 40% 20% 50% 20%

H φ 20% φ

(sul G)

*a tempo* *poco rubato*  
 21 S.T. S.P. *tr* *gliss.* *gliss.* S.P. S.T. *gliss.*

*ppp* *mp* *p*

R 20% 50% 30%

H φ

change gradually the rev. time → ca. 15"

22 (S.T.) (sul D, G) S.T. (sul G) S.P. S.T. *ppp* *f*

*gliss. libero* *gliss. libero* *tr* *tr*

*p* *ppp*

R 30% (rev. time ca. 15") 40% 20%

23 S.P. S.P. S.T. S.P. *pp* *ff* *ff* *mp*

*gliss.* *gliss.*

R 20%

H  $\phi$  50%  $\phi$

24 S.T. S.P. S.P. S.T. S.P. *pp* *ff* *pp* *ff*

*gliss.* *gliss.* *furioso* *gliss.*

R (20%)

H  $\phi$  50%  $\phi$  50%  $\phi$

25 S.P. S.T. S.P. S.P. S.T. *ff* *ppp* *ffff* *ppp*

*calando* *furioso* *calando* *gliss.*

R (20%) 40% 20% 40%

H  $\phi$  50%  $\phi$

26 *furioso* S.P. → S.T. → S.P. *calando* *poco furioso*

*fff* *gliss.* *tr.* *gliss.* *pppp* *f+*

Irregular trill alternating between 1/4 up and 1/4 down

R 40% ————— 20% ————— 30% - - - - -

27 S.P. *calando* E.F. (ord.) S.T. *dolcissimo*

*f* *gliss.* *ppp* *f* *mp*

R 30% ————— 20% ————— 30% - - - - -

28 S.P. → S.T. *gliss.* S.T. → S.P. S.P. → S.P.

*mp (sempre)* *mp* *mp* *mp*

don't lift the lower finger

R (30%) - - - - -

H φ ————— 30% ————— φ

29 → S.T. S.T. → S.P. → S.T. S.T. → S.P.

*mp* *gliss.* *gliss.* *mp* *(sul G)*

R (30%) - - - - -

H φ ————— 30% ————— φ φ ————— 30% ————— φ

30 S.P. → S.T. → S.P. → S.T. → S.P. E.F.

*mp* *gliss.* *tr.* *gliss. (sempre sul G)* *mp*

ca. 10" don't lift the lower finger at least 20" at least 25"

change gradually rev. time 15" → ca. 30"

R 30% ————— 50% ————— 50%

H φ ————— 50% ————— 50%