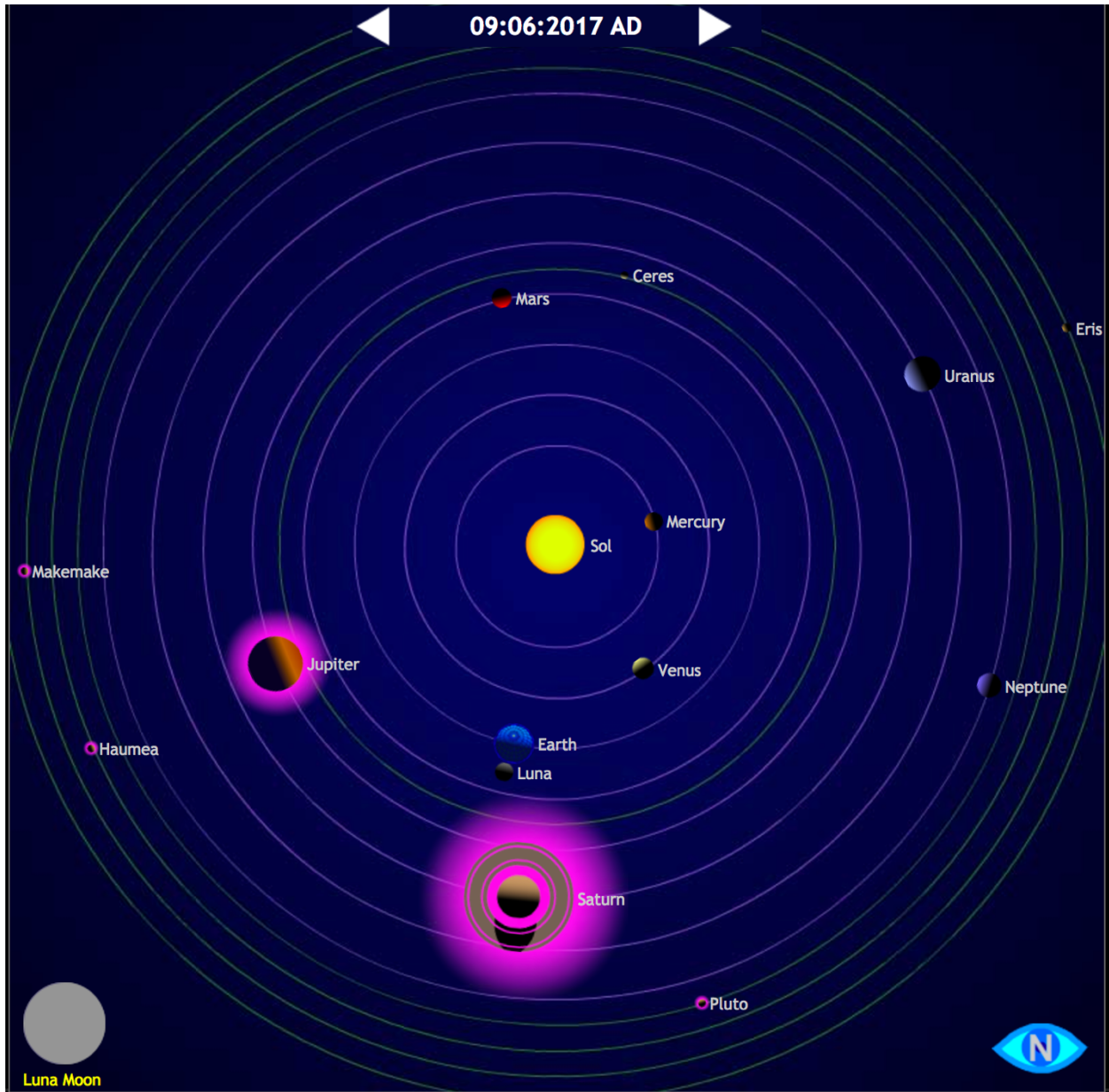


SOLAR SYSTEM MUSIC

09:06:2017 AD



Title: *Solar System*
Composer: *Lilac Atassi*
June 9, 2017

- For a Gong plus any set of 8 instruments that can play the frequency ranges listed in the table below in page 3.
- Instrumentalists must have a tuner and try to reach the exact listed frequency, in page 3, as possible.
- The piece starts with hitting the Gong extremely loudly in the middle and repeat every 27 seconds (the players would need a stopwatch). Gong keeps the sound going for 27 seconds and use amplification if needed.
- All instruments play after the Gong plays in the order of their positioning while keeping the sound going during the 27 seconds. It doesn't matter who starts playing after the Gong plays as long the order stays consistent during piece.
- The piece length is 27 minutes: Every instrument gets to play its given notes 60 times.
- Dynamics: Play the note the loudest you can and hold it with allowance for gradual decay until the next iteration (the sun rises again or the Gong plays again).
- In order to know the positioning of the instruments around the sun, which is the Gong in the center of the performance circle, you need check this website: <http://www.theplanetstoday.com/index.html> and get the positioning of the planets on the performance day.
- Distance from the center is approximate but calculated as listed in page number 4 and 5.
- I recommend the instrumentalist to wear black or dark colors (Space is dark).
- Sun is represented by a Gong Playing in the middle Loudly every 27 Seconds (The Sun rotates every 27 days), or by a rotating speaker playing constant loud white noise, you can use a turning table and in this case instrumentalists play once the speaker faces them.

Frequencies of Planets/Instruments:

JUPITER:	F#4	-13 cent
SATURN:	D3	+12 cent
URANUS:	G#2	-2 cent
NEPTUNE:	G#1	+32 cent
EARTH	C# 5	-31 cent
VENUS:	A1	+10 cent
MERCURY:	C#7	+33 cent
PLUTO:	C#1	+26 cent
MARS	D5	-25 cent

Get the radius of the room, or the circle or the performance venue:

If X = distance from Pluto to Sun.

R= radius of the room.

Y= distance of the planet “instruments” to room center.

$Y=R/ (x/y)$

Distance of **Mercury to the center** (Gong)
is $R/ (3674.5/36) = R/102.06$

Distance of **Venus to the center** (Gong)
is $R/ (3674.5/67.2) = R/54.68$

Distance of **Earth to the center** (Gong)
is $R/ (3674.5/93) = R/39.51$

Distance of **Mars to the center** (Gong)
is $R/ (3674.5/141.6) = R/25.94$

Distance of **Jupiter to the center** (Gong)
is $R/ (3674.5/483.6) = R/ 7.95$

Distance of **Saturn to the center** (Gong)
is $R/ (3674.5/888.67) = R/ 4.13$

Distance of **Uranus to the center** (Gong)
is $R/ (3674.5/1784) = R/ 2.059$

Distance of **Neptune to the center** (Gong)
is $R/ (3674.5/2,794.4) = R/ 1.314$

Distance of **Pluto to the center** (Gong)
is $R/ (3674.5/3674.5) = R/ 1$ Pluto sits on R

Example:

If R is 16 meters then:

Distance of **Venus to the center (Gong)**
is $R / (3674.5/67.2) = 16/54.68 = 0.29 \text{ m}$

Distance of **Earth to the center (Gong)**
is $R / (3674.5/93) = 16/39.51 = 0.4 \text{ m}$

Distance of **Mars to the center (Gong)**
is $R / (3674.5/141.6) = 16/25.94 = 0.6 \text{ m}$

Distance of **Jupiter to the center (Gong)**
is $R / (3674.5/483.6) = 16/ 7.95 = 2.01 \text{ m}$

Distance of **Saturn to the center (Gong)**
is $R / (3674.5/888.67) = 16/ 4.13 = 3.87 \text{ m}$

Distance of **Uranus to the center (Gong)**
is $R / (3674.5/1784) = 16/ 2.059 = 7.77 \text{ m}$

Distance of **Neptune to the center (Gong)**
is $R / (3674.5/2,794.4) = 16/ 1.314 = 12.17 \text{ m}$

Distance of **Pluto to the center (Gong)**
is $R / (3674.5/3674.5) = 16/ 1$ Pluto sits on $R=16 \text{ m}$

Appendix:

The Planets in Our Solar System

Planet (or Dwarf Planet)	Distance from the Sun (Astronomical Units miles km)	Period of Revolution Around the Sun (1 planetary year)	Period of Rotation (1 planetary day)	Mass (kg)	Diameter (miles km)	Apparent size from Earth	Temperature (K Range or Average)	Number of Moons
Mercury	0.39 AU, 36 million miles 57.9 million km	87.96 Earth days	58.7 Earth days	3.3×10^{23}	3,031 miles 4,878 km	5-13 arc seconds	100-700 K mean=452 K	0
Venus	0.723 AU 67.2 million miles 108.2 million km	224.68 Earth days	243 Earth days	4.87×10^{24}	7,521 miles 12,104 km	10-64 arc seconds	726 K	0
Earth	1 AU 93 million miles 149.6 million km	365.26 days	24 hours	5.98×10^{24}	7,926 miles 12,756 km	Not Applicable	260-310 K	1
Mars	1.524 AU 141.6 million miles 227.9 million km	686.98 Earth days	24.6 Earth hours =1.026 Earth days	6.42×10^{23}	4,222 miles 6,787 km	4-25 arc seconds	150-310 K	2
Jupiter	5.203 AU 483.6 million miles 778.3 million km	11.862 Earth years	9.84 Earth hours	1.90×10^{27}	88,729 miles 142,796 km	31-48 arc seconds	120 K (cloud tops)	67 (18 named plus many smaller ones)
Saturn	9.539 AU 886.7 million miles 1,427.0 million km	29.456 Earth years	10.2 Earth hours	5.69×10^{26}	74,600 miles 120,660 km	15-21 arc seconds excluding rings	88 K	62 (30 unnamed)
Uranus	19.18 AU 1,784.0 million miles 2,871.0 million km	84.07 Earth years	17.9 Earth hours	8.68×10^{25}	32,600 miles 51,118 km	3-4 arc seconds	59 K	27 (6 unnamed)
Neptune	30.06 AU 2,794.4 million miles 4,497.1 million km	164.81 Earth years	19.1 Earth hours	1.02×10^{26}	30,200 miles 48,600 km	2.5 arc seconds	48 K	13
Pluto (a dwarf planet)	39.53 AU 3,674.5 million miles 5,913 million km	247.7 years	6.39 Earth days	1.29×10^{22}	1,413 miles 2,274 km	0.04 arc seconds	37 K	4
Planet (or Dwarf Planet)	Distance from the Sun (Astronomical Units miles km)	Period of Revolution Around the Sun (1 planetary year)	Period of Rotation (1 planetary day)	Mass (kg)	Diameter (miles km)	Apparent size from Earth	Temperature (K Range or Average)	Number of Moons

*Source: (<http://www.enchantedlearning.com/subjects/astronomy/planets/>)

planet	orbital period	frequency (Hz)	key	octave	tune	cent
MERCURY	87,97 gg	$1,3156842 \cdot 10^{-07}$	C#	-27	up	+33 ce
VENUS	224,7 g	$5,1509009 \cdot 10^{-08}$	A	-29	up	+10 ce
EARTH	365,26 gg	$3,168722 \cdot 10^{-08}$	C#	-29	down	-31 ce
MARS	686,98 gg	$1,684776 \cdot 10^{-08}$	D	-30	down	-25 ce
JUPITER	4332,59 gg	$2,6713984 \cdot 10^{-09}$	F#	-33	down	-13 ce
SATURN	10759,52 gg	$1,0757054 \cdot 10^{-09}$	D	-34	up	+12 ce
URANUS	30684,4 gg	$3,7719734 \cdot 10^{-10}$	G#	-36	down	-2 cen
NEPTUNE	60195 gg	$1,9227634 \cdot 10^{-10}$	G#	-37	up	+32 ce
PLUTO	90475 gg	$1,2792566 \cdot 10^{-10}$	C#	-37	up	+26 ce

Source:(http://www.pianopianoforte.com/piano_music/piano_music_english/the%20sound%20of%20the%20planets.html)