

# Pluto

## Ingredients

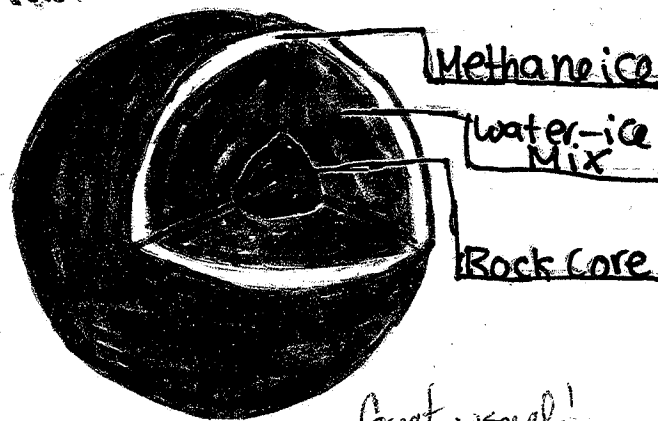
Big Bang (with left overs)  
Clumps of Dust  
Methane Ice  
Methane Gas  
Cold, Frost Zone  
Water-ice mix

## Steps

1) Take the Clumps of Dust and knead them together for a few Million years till you end up with the core of your planet.

2) Then we take our core and cover it with the water-ice mix.

3) After, we Sprinkle generously, Methane ice over the whole planet.



Great visual!

Note: The end result should be 2,300 km in diameter, with a Mass of  $1.29 \times 10^{25}$ .

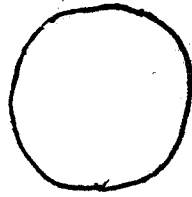
Sun

○ Mercury

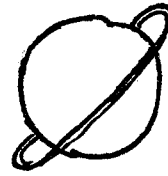
○ Venus

○ Earth

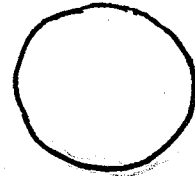
○ Mars



Jupiter



Saturn



Uranus



Neptune

○ Pluto

Planets

736

4) Lastly put the Methane gas into your planets atmosphere and now you have a planet.

Note:  
Because your planet is 5869,660,000 km from the sun it is one of the coldest places in our Solar System. The temperature may be down to  $-375^{\circ}\text{F}$ .

*Nice reference to sun.*

Note: Don't worry if the gravitational pull is not as strong as you used to, its just because its further away from your sun. -good.

One last thing, the days and years will be much longer too. Every 6 days is one day on Pluto, and it takes 248 Earth years for Pluto to orbit the sun once.

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Date: March 10, 2010

## Bibliography

website:

[www.nasa.gov/worldbook/pluto\\_worldbook.html](http://www.nasa.gov/worldbook/pluto_worldbook.html)

Artical writen by: Hyron Spinrad, PH. D.  
Professor of Astrohamy, University of  
California, Berkeley.

Book:

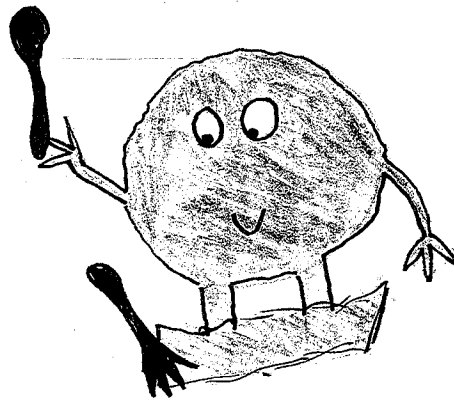
The Solar System edited by Giovanni Caprara

Published in 2003 by Firefly Books inc.

# Venus Casserole

Jill

March 10, 2010

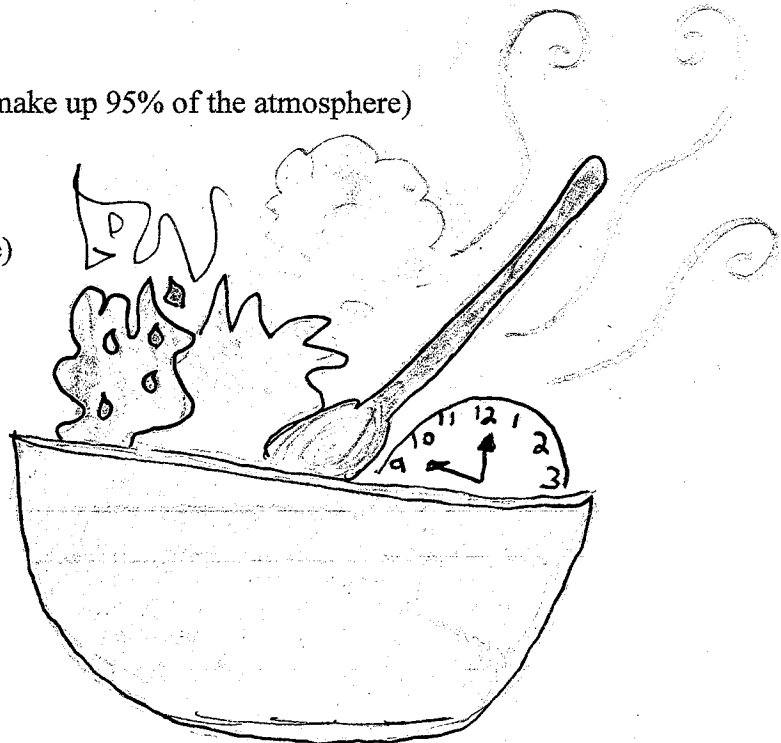


*Prep time: a few billion years*

Venus is a delicious and tasty planet with a diameter of 12,100 km and a mass of  $4.869 \times 10^{24}$  kg. It's only 108,200,000 km away from the sun! This scorching planet will be sure to warm you up on a cold day! Venus tastes a little bit like earth because they are similar in size and composition, but after slurping up dense clouds and hot volcanoes you'll soon find out why Venus is so much tastier than the other planets. Before you try to cook Venus, you **MUST** cook up the universe because Venus's main ingredients is the **BIG BANG!**

## Ingredients:

1. Big Bang (nebula clouds, hydrogen, helium, gravity, sun's heat, cold)
2. A few Million years
3. Lots Carbon dioxide ( to make up 95% of the atmosphere)
4. A pinch of nitrogen
5. Molten metal (for the core)
6. Sulfur dioxide
7. Argon
8. Carbon Mioxide
9. Oxygen
10. Clouds
11. Wind



To start, mold leftover dust and gas from the great nebula and the creation of the sun into small clumps. This molding process is called accretion. Smush those clumps for a few million years and cover with gas and dust. Don't breathe in any of the fumes while you're mixing and smushing, because Venus' atmosphere is toxic to terrestrial life forms! → Great reference!

To create Venus' atmosphere you're going to need a lot of Carbon dioxide. (95%) you'll also need some nitrogen and sulfuric acid. Like earth, Venus has an iron core and a molten rocky mantle. In order to achieve the right texture for the mantle and core you need to keep Venus very close to the sun. Venus' crust is strong, thick, and very buttery! The mantle produces stress on the surface, is released through mountains and volcanoes. If made correctly, the volcanoes erupt hot sauce lava! } Geology

If you've been correctly mixing of gas and dust for the last few million years, you should have formed the elliptical (but almost <sup>nicer!</sup> circular) orbit around Venus. This orbit should be the least elliptical of the planets. Mix in some gravity and gravity to keep it in orbit. It takes Venus 224.7 earth days to complete one orbit around the sun or one earth year. Venus rotates very slowly, it takes 243 earth days for one rotation, or one day on earth, but if you are very patient Venus will become even more delicious with each orbit!

Venus needs to be baked at a very high temperature, about 900 degrees. <sup>Interesting!</sup> And you need to apply a surface pressure that is 100X what we feel on earth. To make the delicious clouds of Carbon Dioxide and sulfuric acid, <sup>↳ due to gravity?</sup> Mix water and sulphur dioxide and add the mixture to the upper atmosphere of Venus. This will later produce some succulent

sulphuric acid rain! The surface <sup>how hot?</sup> temperature of Venus is so high that this juicy, sulphuric acid rain never gets to ground level.

Almost done! In order to do the last step you have to wait until the 1960s and 70s. When that time period comes, send out a spacecraft. This will tell you how to make Venus' dense, crispy clouds. Usually the clouds of Venus are made up of the green house gas, carbon dioxide, this is what is keeping the planet so hot. Before serving blow on it a lot because Venus' winds blow at speeds greater than 100 m/s. *wow!*

I hope you enjoy your crispy, rocky, dusty, delicious, waterless space of mountains, canyons, plains, and hardened lava!

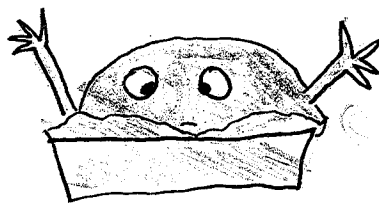
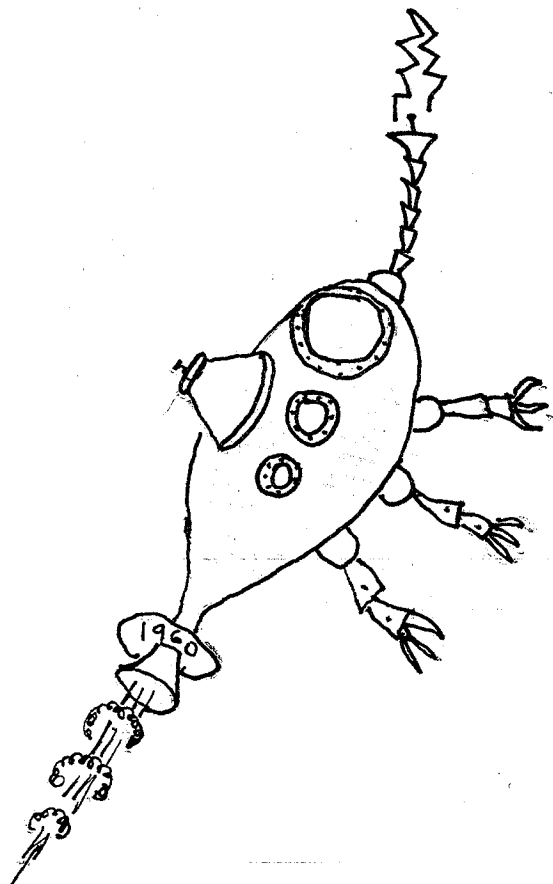
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Caprara, Giovanni. "The Solar System" Firefly Books (2003)

<http://www.space.com/venus/>

<http://www.aerospaceguide.net/planet/planetvenus.html>

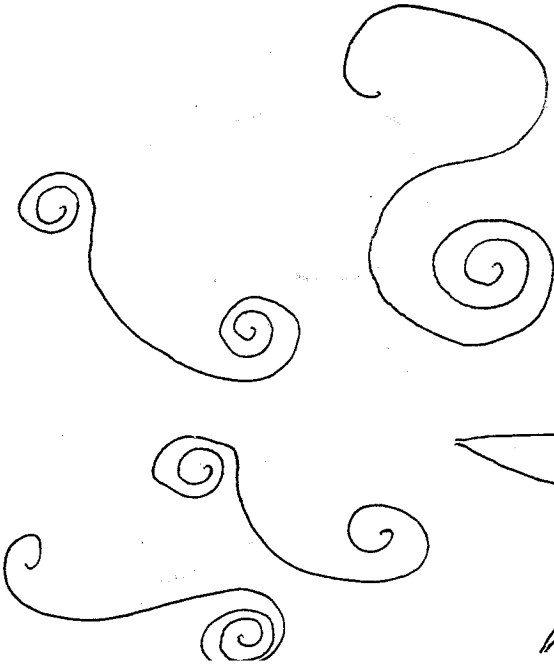
<http://nineplanets.org/venus.html>



Shannon  
3/11  
Science

# Neptune

The icy blue planet



## \* Ingredients \*

- big bang
- nebula's nuclear energy
- light elements (hydrogen & helium)
- heavy elements (Iron, nickel & aluminum)
- gravity
- Sun's heat
- Cold, frost zone

1. Begin with a big bang. Later elements were limited to hydrogen and helium. It is believed that stars could grow up to 100 times the size of the sun

*Interesting* Without the presence of metals. At the end of the star's lives there were explosions so great, the first 26 elements were formed.



2. Take a pre-solar nebula and throw in 2% of heavier elements. In order to get heavier elements you need nuclear fusion. - Nice!

Stir your nucleosynthesis base so fast that the material within it condenses, causing atoms to collide.

A lot of heat is created in the star's center which forms a strong gravitational pull.

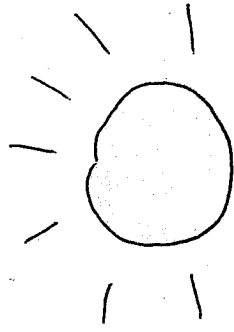
Put aside for 100,000 years to allow magnetic fields, gravity and rotation to flatten into a protoplanetary disk and a protostar. Great explanation of how the solar system came to be!

Leave in galactic pressure cooker for 50 million years until the temperature and pressure at the core of the protostar become so great that its hydrogen atoms begin to fuse.

Over time the protostar begins to expand until an equilibrium point is reached.

Fuse hydrogen into helium to create enough energy to form your Sun.

Set aside to allow nuclear processes to continue.



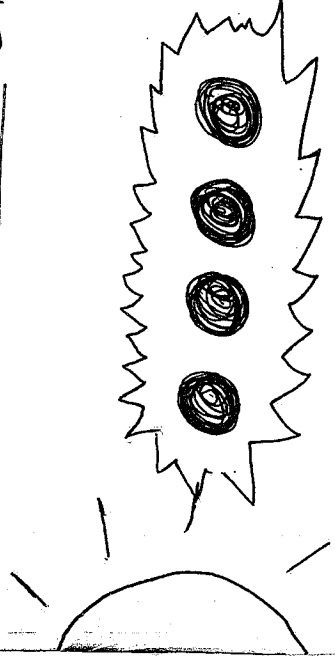
Take the left over ingredients from starting your sun and a planet is ready to be created!

Carefully mold dust grains into clumps between 1-10 km in distance. This process is called accretion.

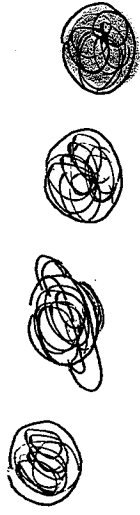
To form early planets, collide the clumps with other ones for a few million years.

Form the terrestrial planets to be about .05 Jupiter units?

Immerse them in gas and dust, causing them to form new orbits inwards.



Travel out to the frost line where it is cold enough for icy compounds to remain solid. This is where the gas giant planets will be created. Nice build up to this point.



Neptune is a gas giant and will be formed out of light and other materials found here.



Neptune is the eight planet from the Sun and was discovered in 1846.

It is the smallest of the gas giants measuring 49,500 kilometers in diameter.

Neptune was named after the Roman God of the sea. Its bluish hue gave the impression of water, but in fact it's just Neptune's thick atmosphere.

It takes Neptune 164 earth years to orbit the sun once.

There are 13 moons that belong to Neptune. The largest one is Triton.

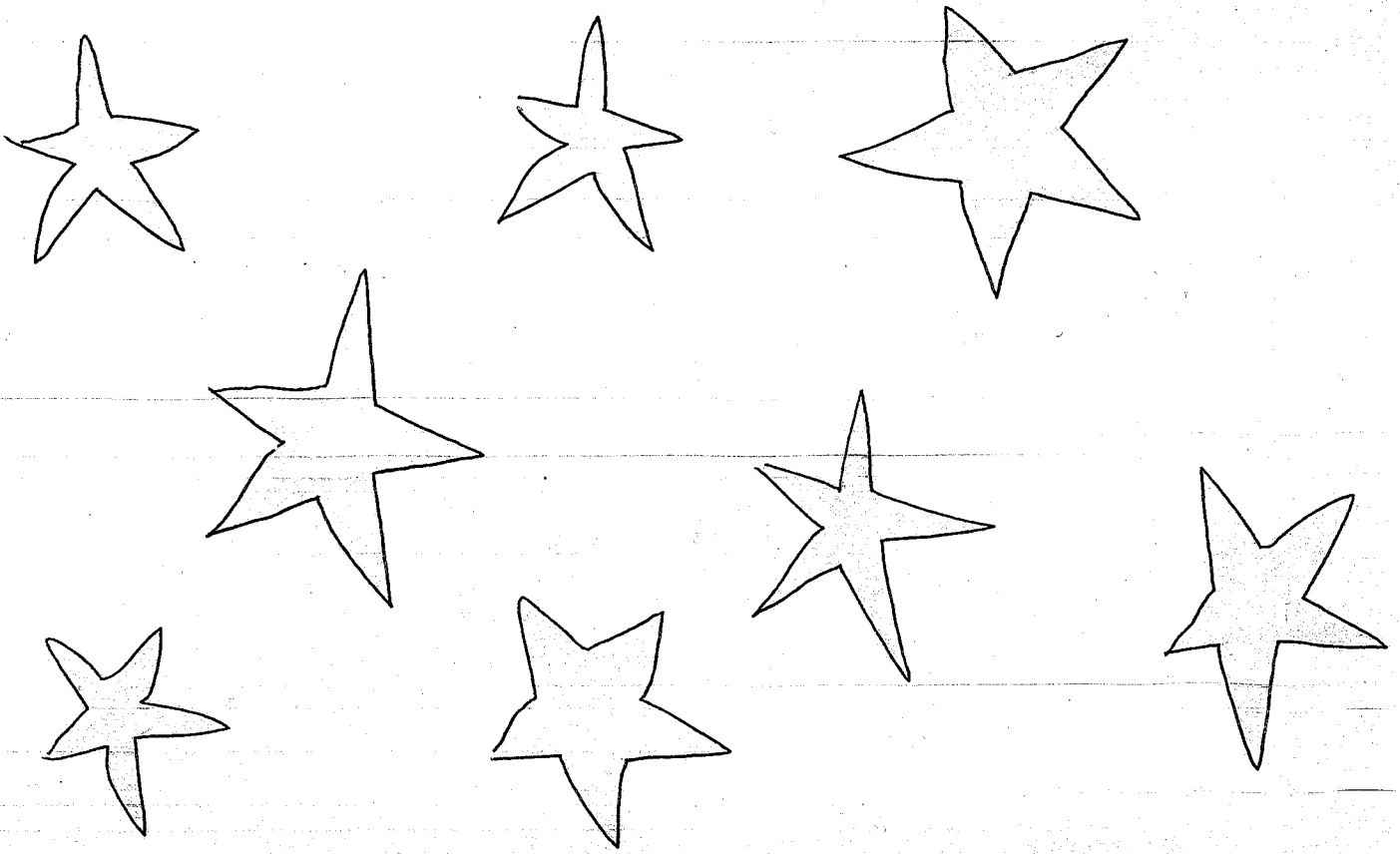
The methane gas on Neptune gives Neptune its blue color.

Like the other gas giants Neptune is mostly made up of hydrogen, helium &

Methane gases.

The dark spot on Neptune which is believed to be a storm that has been raging for 400 years disappeared recently. It is unclear if it means the storm has died or is on the other side of the planet.

Neptune also has a faint set of rings and its winds can reach up to 1,200 miles per hour!  
Wow!



Chris  
Disk

## Jupiter Saute Aux Lunes

1 Protoplanetary Disk

Plenty of Hydrogen and Helium (and some other light elements)

Methane

Water

Liquid Metallic Hydrogen (for a more robust core)\*

A smidge of thinly diced and tightly compacted rocky materials of your choice

630,000,000 Psi of Core Pressure *wow!*

~63 Moons

The planet itself:

Preheat Sun to about 10,000 degrees F (surface temp), allow preheating for 4 billion years. Chill protoplanetary disk and roll into eight servings of planetoids. Pay close attention to creating the smaller terrestrial planets closer to the HZ or habitable zone and keep the gas giants farther from the sun. Let hydrogen fusion create heavier elements for terrestrial planets. Apply more and more pressure to the fifth planetoid until a small dense core is created. Let this core's gravitational pull collect more and more hydrogen and helium and other gases (for flavor) until atmosphere reaches 89% hydrogen, 10% helium, 0.3% methane, 0.026% ammonia, and 0.003% hydrogen deuteride. Rotate at 9 hours 55 minutes a day and place in orbit at an average of 778 million km from the sun. Orbit Jupiter at 1 year per 11.86 Earth Years.

*Nice terminology!*

*very creatively written Chris!*

Saute Aux Lunes:

Take the gravitational pull of Jupiter and attract around 63 moons or so. Once your moons are caught in the gravitational field around Jupiter you may begin to sprinkle

*Interesting!*

water over some moons. Pay special attention to Europa. This moon is extremely important to be done correctly.

## Europa

-Forge an outer ice shell that melts and reforms every 50 million years like a lava lamp.

-Use plenty of oxygen when creating hidden oceans. Life must find a way here.

-IMPORTANT: Many nutrients must be present in the outer core at the bottoms of the ocean in order for complex life to survive.

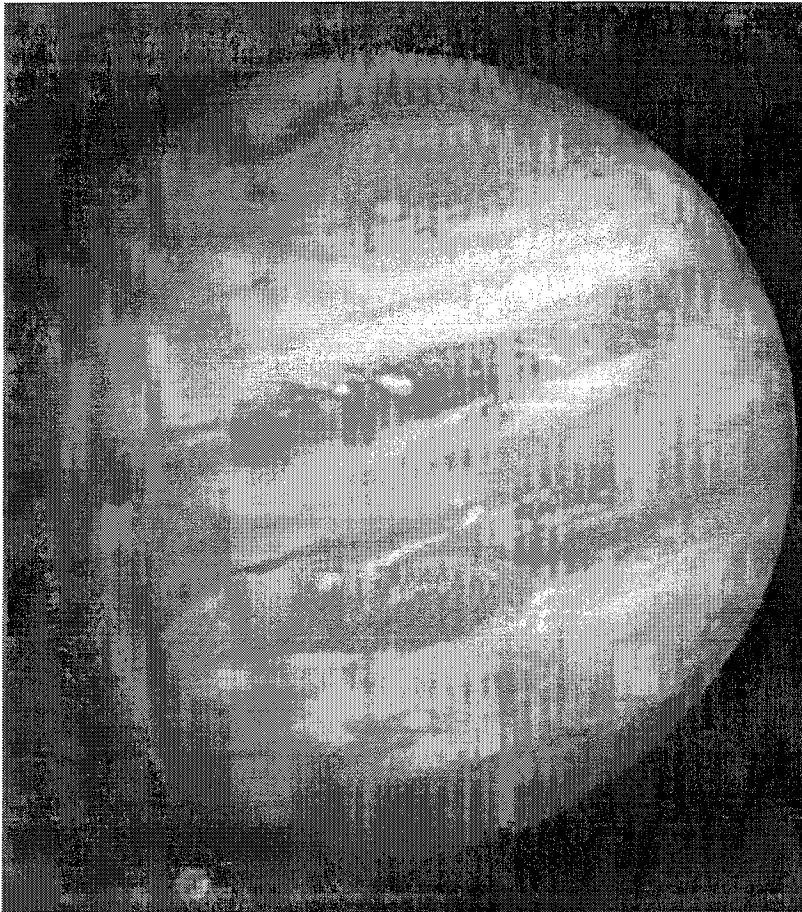
*what implications does this have?*

You may cluster moons however you like.

Finish with one icy ring about the oblate sphere of the planet. Because of the speed of the rotation of your planet there will be a slight but noticeable bulge at the equator. This is normal and do not try to re-sculpt the shape. We have come this far haven't we? *Good reference*

Sprinkle with miscellaneous spices and heavier elements and serve. Serves 317.8 Earths. ☺

*↳ including what?*



Photograph of Jupiter by Voyager I. This photograph was taken at a distance of 25 million miles. Bon Appetite.

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Isaac Shaw

Excerpts from  
A Galactic Chef's  
Notebook

Note to self - Must try a Pan-Galactic  
Gorgle Blaster  
☺

# Jupiter

Isaac Shaw

## Ingredients

- Please Prepare Nebula Cloud Dough
- Gravity
- Frost Zone
- Heavy Elements (Iron-lithium)
- Fusion Leftovers

## Directions

1. Choose a nice big cloud of dough and toss it in the galactic mixer. It should begin to collapse into protostars. Continue mixing until hydrogen atoms in the protostars collide. The nuclei of the hydrogen will fuse together releasing massive amounts of energy\*. This is called "nuclear fusion". Now you have lots of little suns. Choose one.  
(or stars?)

\* = This is Dangerous and could kill you!

2. Add to your sun the heavy elements, gravity, leftovers, and a frost zone. Now you may begin to craft your planet.

3. Form the core from heavier elements and hydrogen. This should be the smallest and most dense part of the planet. Surround the core with a very thick layer of metallic hydrogen. Next comes a layer of liquid hydrogen and helium, and finally a layer of gaseous hydrogen and helium. The core and the outer layer should be about 30,000°C and -110°C respectively.

Nice use of highlighting terminology and concepts

Great connections!

4. Add some compounds for color on the surface. Ammonia for white and orange and water/ice for blues. The atmosphere should be about 90% hydrogen and 10% helium and other elements and compounds.

this is the depth and connections we were looking for - yes!

5. Place Jupiter past the frost zone. Taking into account the sun's gravity and Jupiter's low <sup>good</sup> density, place it far enough that it can keep a good orbit, and a steady temp. of -110°C.

6. When setting it in orbit do not give it a very hard push. It should orbit about once every 12 years. While we don't want it orbiting very fast, we do want to give it a good spin on its axis. Make sure it is rotating roughly once every 10 hours, faster than any other planet in the solar system. wow!

7. Jupiter is now done. Garnish with five dozen moons and serve.

# Nebula Cloud Dough

## Ingredients

- Elements
- 1 singularity
  - Hydrogen
  - Helium
  - 1 pinch of Lithium

## Directions

1. Take out the singularity and allow it to rise. As it does add the elements and shake well. This should result in what we galactic chefs call a "Big Bang".

Sweet

**Warning: This will probably kill you!**

2. Before long the elements will start appearing and forming Nebulas. If you intend to make stars out of them use them up quickly because eventually they will go bad and turn into stars on their own.

Ha! Good point

**Warning: The collapse of nebulas to form stars with nuclear fusion involves a massive release of nuclear energy. This will also probably kill you! The formation of stars is best done in a controlled environment.**

yes

3. You now have plenty of nice nebulas to choose from. Serve while still warm or use as a base for something else.

From the Heavenly Cook Book, Celestial Recipes for Unearthly Beings:

Saturn

After you have finished with the Big Bang and Milky Way recipes, you may begin with this side dish of Saturn. You will need:

\*A very chilly atmosphere in which to create your masterpiece.

\*Hydrogen (97%)

\*Helium (3%)

\*Ice

\*A moon from an unknown origin

\*Unknown amounts of methane, iron, ammonia and water.

\*Special unknown gasses for coloring

- 1) After you finish the Milky Way and other planets, use whisk to whip the hydrogen and helium into an orb about 60,268 kilometers at the equator, making sure that if you try to take a step onto the surface, you immediately sink through to the other side. *→ Interesting application and mental picture! gas giant?*
- 2) Drop in an iron core and add the ammonia, methane and water. Keep stirring, making the winds blow at a good strong velocity (1,100 miles an hour is perfect), *Wow!* making them strongest at the equator.
- 3) Flatten the poles, not too much, but enough so probes out in space can pick them up.
- 4) Before you color, you may wish to test the density by trying to find an ocean large enough to hold Saturn and placing it on the water. If it floats, you have done well so far. If you pass this test, whip the unknown gasses into the mix, creating the prettiest planet in the solar system. Sprinkle about 70 moons around it.
- 5) Set the main mix into orbit 885,904,700 miles from the sun and let it circle while you select a moon with a large amount of ice, or a comet if you wish and send it flying into the orbit of some of the moons. Let them smash into pieces ranging from the size of dust to the size of a house and allow them to form your rings, measuring in thickness 660 to 9,800 feet in thickness and about 180,000 across. Make sure some moons remain in the orbit of the rings, so they have gaps.

Cool reference!  
Can you test the density of gases in the same way?

Any concluding thoughts or steps?

Turned in 3/12

# How To Make a Proper Venus

By, Liz hauty and Alex Velez

## INGREDIANTS

- Central iron core
- Rocky mantle (similar to the composition of Earth)
- Carbon dioxide (96%)
- Nitrogen (3%)
- And a pinch of other gases

### Pre-prep

In Order to make a proper Venus, you need to first create a big bang. In order to make a big bang you need to begin with a singularity, once the inflationary period begins, the universe will have expanded enough to fit your Venus. *Nice!*

1. First mix the carbon dioxide, nitrogen, nickel, iron, silicite and other gases together and set aside. These ingredients will create the crunchy rocky mantle. Delicious as it may sound, these ingredients mixed together have created a poisonous atmosphere. We suggest that you do not inhale or eat any part of your rocky mantle or any part of Venus for that matter. ☺

Do these two contradict?

2. Set ingredients into the colossal oven of doom. Oven should be set at 900 degrees Fahrenheit and have a humidity of 70%. Your Venus should not drop in temperature or humidity. Because Venus's plate tectonics *interesting!* have shut down, Venus has a hardcore greenhouse effect, creating all the heat. Without the heat escaping, convection at the core of Venus shut down as well, and the planet lost its worldwide magnetic field. *why is that?*

Keep Venus in the oven for 224.7 days *or one year*. Remember, one Venus day is equal to 243 earth days. *Rotation*

3. When checking on your Venus, make sure that there are plenty of acid clouds and little to no water. If the atmosphere happens to crush you to death because of its intense pressure, don't be alarmed, that's supposed to happen. *how much?* The atmosphere should

consist mostly of carbon dioxide so if the pressure doesn't kill you,  
the lack of oxygen will. *Wow. Good Point.*

When your Venus is done it should have a diameter of 12104 km, a  
radius of 6052 km. Venus's mass consists of 81.5% that of Earth and a  
density of 5.24 g/cm<sup>3</sup>. If you could stand on the surface, you would  
experience about 90% of the gravity you feel on Earth.

*I like this  
type of comparis  
it makes the  
information  
relative.*

*Great!*

Set your Venus at an average distance of 108.2 million km from the Sun.  
Make sure it is rotating clockwise. Venus is the only planet in the Solar  
System that rotates clockwise on its axis.

ENJOY YOUR NEW PLANET!

