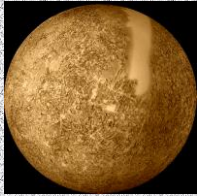


# LOCAL AND GLOBAL SYSTEMS ON VENUS AND EARTH: LESS ACTIVITY ON AIR-PLANET VENUS FOR CHANGE OF VOLATILES

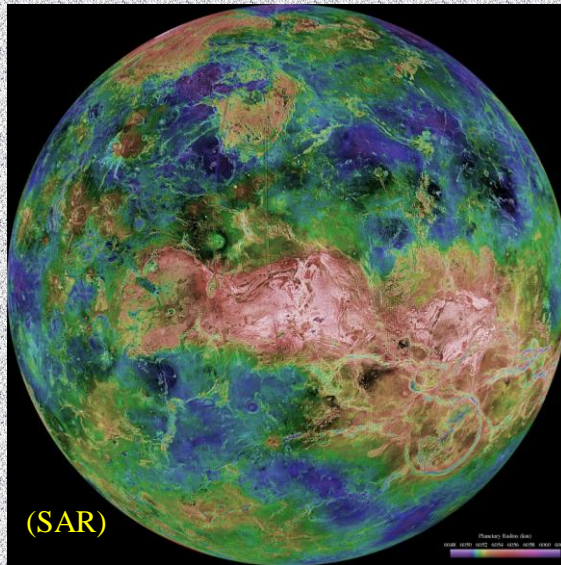
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Mercury



No air

Venus



(SAR)

Air (Hot carbon-rich)

Earth



Air (Pressed water with less carbon)

Mars



Air (Cold carbon-rich)

NASA

Images: NASA

Y. Miura (2016)

## Introduction

No clear materials from Venus!  
Less activity on solidified Venus?

## Air source of carbon dioxides of air-planets

Venus shows exothermic air with carbon!  
No deposits for hot Venetian air?

## Relation of activity ranges of material-states

Global water is pressed by air and solid systems!  
Local water ions are stored in all solidified rocks!

## Main causes for activity range of materials

All space rocks include volatiles by impact process!  
Water makes crystals (Earth) or less crystals (Venus)!

## Solidified evidences of material-state changes

Texture of phenocryst (solid) & groundmass (liquid)!  
Irregular texture is formed by impact melting (Exp)!

## Conclusion

New model of local impacts for rocks with volatiles!  
Glassy solids of rock textures are from impact melting  
(on Mars-Earth & Asteroids; possibly on Venus)!

# Venus (SAR)

## <Venusian Materials & Volatiles>

⇒ In this study!

**Materials:** ① Life, ⑤ Rock, ⑥ Crust, ⑦ Crater, ⑧ Magma, ⑨ Core, Mantle, ⑩ Interior

**Volatiles:** ② Water, ③ Weathering, ④ Atmosphere

Y. Miura (2016)

## Top Ten Questions about Venus (NASA)

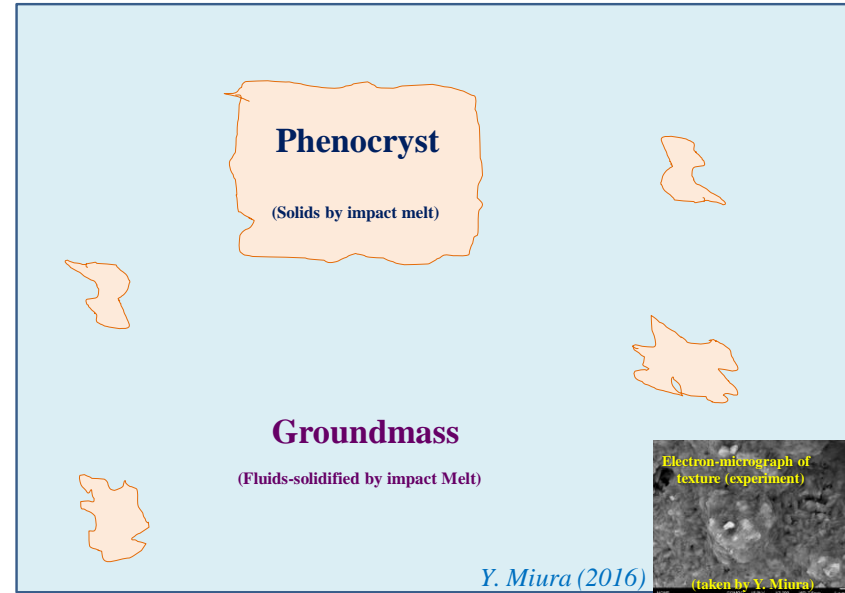
### <Venus Geology & Geophysics>

- ② Surface (sea) water or interior? Weathering Process? ③ Weathering Process?
- ⑤ Different volcanic rocks and events or magma ocean?
- ⑥ Ever plate tectonics of crustal recycling? Ancient primary crust?
- ⑦ Cratering rate? An early cataclysmic bombardment? A giant impact? No moon?
- ⑧ Different rocks and internal Venusian differentiation and of magma source?
- ⑨ Overall chemical composition of Venus? Venusian core and mantle? Mineralogy?
- ⑩ Geophysical properties (heat flow, seismic activity, etc.) of the ? Interior structure?

<Venusian atmosphere> ④ Composition & evolution of the atmosphere?

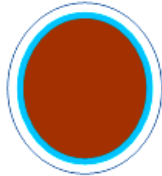
<Life or habitable?> ① Ever a habitable planet with sustain life?

## Mars (Venus) rock texture (Impact-melted process)



Y. Miura (2016)

Air-Water-planet  
(Earth)



Global three systems  
(vapor, liquid and solid systems, VLS)

Well active planet  
(Global circulated activity) → Crystalline solid

Air-planet  
(Venus, Mars)



Global two systems  
(Vapor and solid system, VS)

Less active planets  
(Local activity) → Poor crystals

Y. Miura (2016)

JPL, NASA

Planetary Radius (km)

6048 6050 6052 6054 6056 6058 6060 6062

Edited: Y. Miura