



# **Opening Remark**

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**(ISEE/KMI, Nagoya Univ.)**

**20<sup>th</sup> ISVHECRI 21May2018**

Thank you so much for coming to Nagoya  
and to this symposium with long tradition,  
connecting different experts

20<sup>th</sup> International Symposium on  
Very High Energy Cosmic Ray Interactions

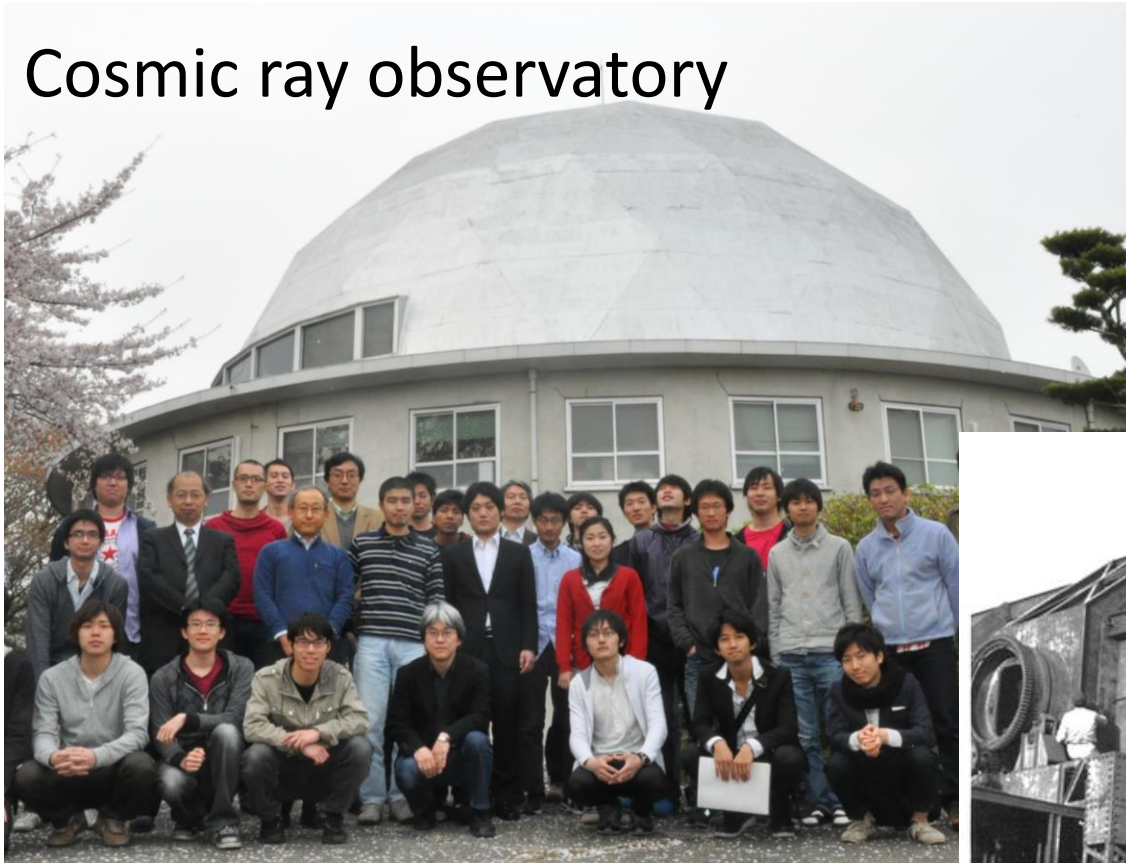
# ISVHECRI2018

21-25 May, 2018  
Nagoya University, Nagoya, JAPAN

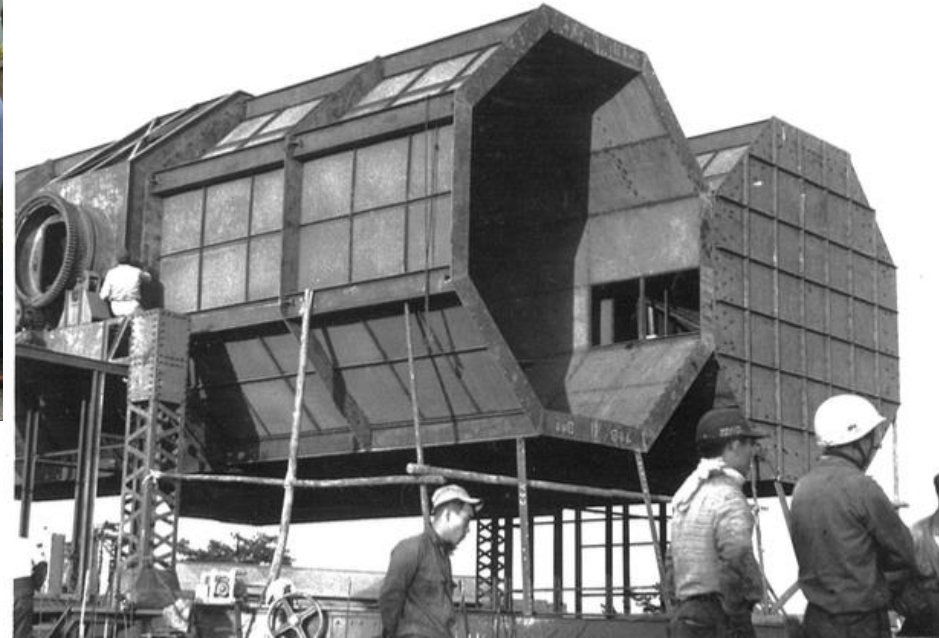
>~120  
participants  
from 16 countries

# Cosmic Ray research in Nagoya

Cosmic ray observatory

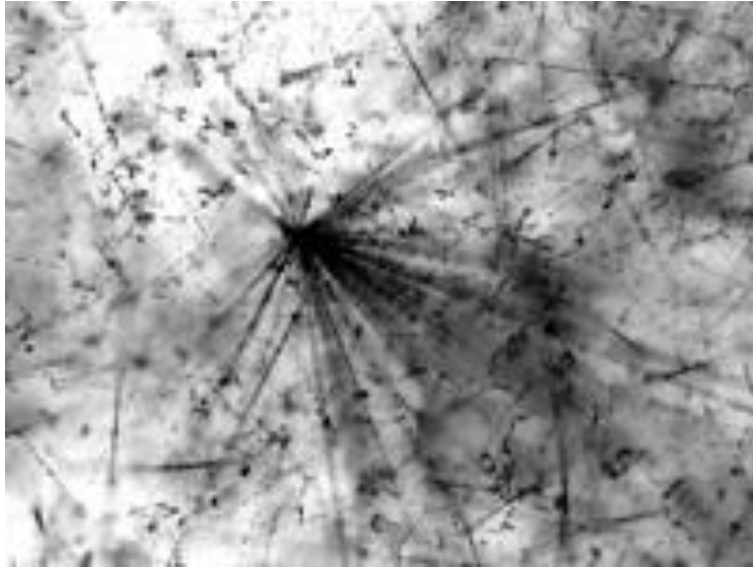


Prof.  
Sekido



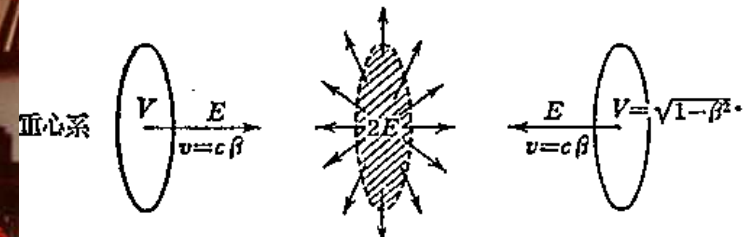
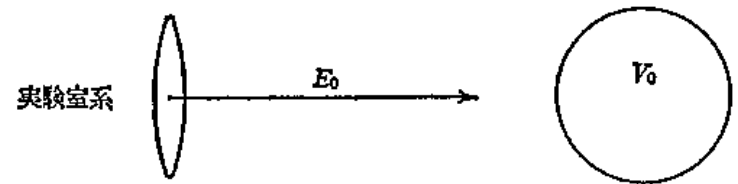
Air Cherenkov muon telescope

# Prof. Niu and nuclear emulsion



Prof Niu

- Discovery of X-particle (charm)
- Niu's fire-ball model
- Auto-scanning system



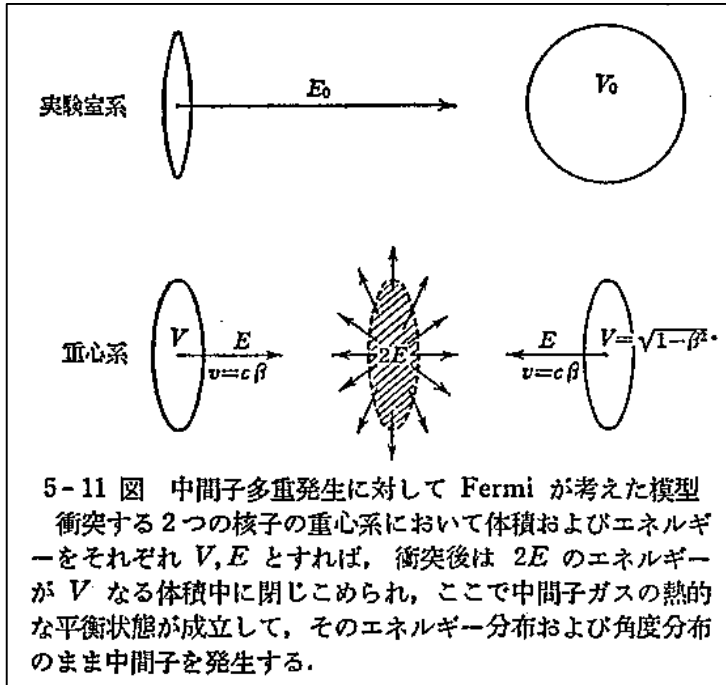
Emulsion lab tour  
May23(Wed)

Minoru Oda "Cosmic rays" (1972)

—をそれぞれ  $V, E$  とすれば、衝突後は  $2E$  のエネルギー

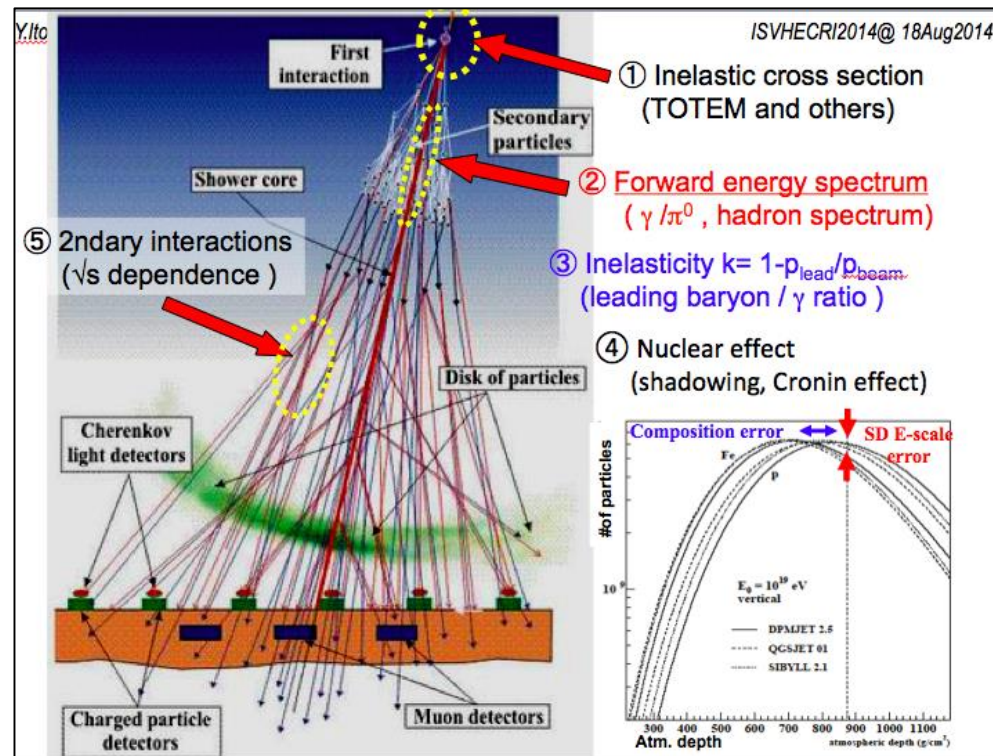


# Paradigm shift



## VHE CR to explore VHE interactions

## VHE interactions to prove VHE CR observations

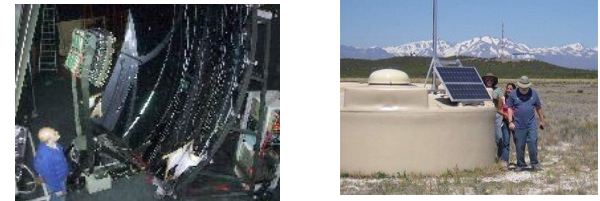


# 10<sup>17</sup> eV : Crossroad of accelerators and UHECRs

Telescope Array



AUGER

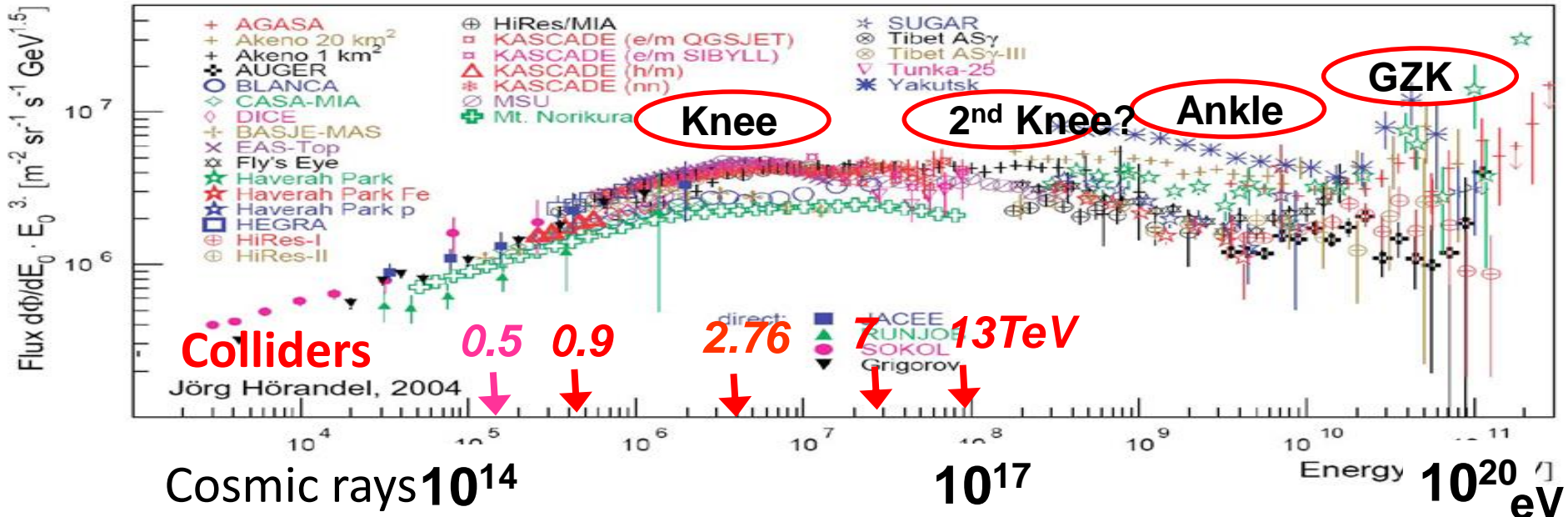


Air shower experiments

HEAT

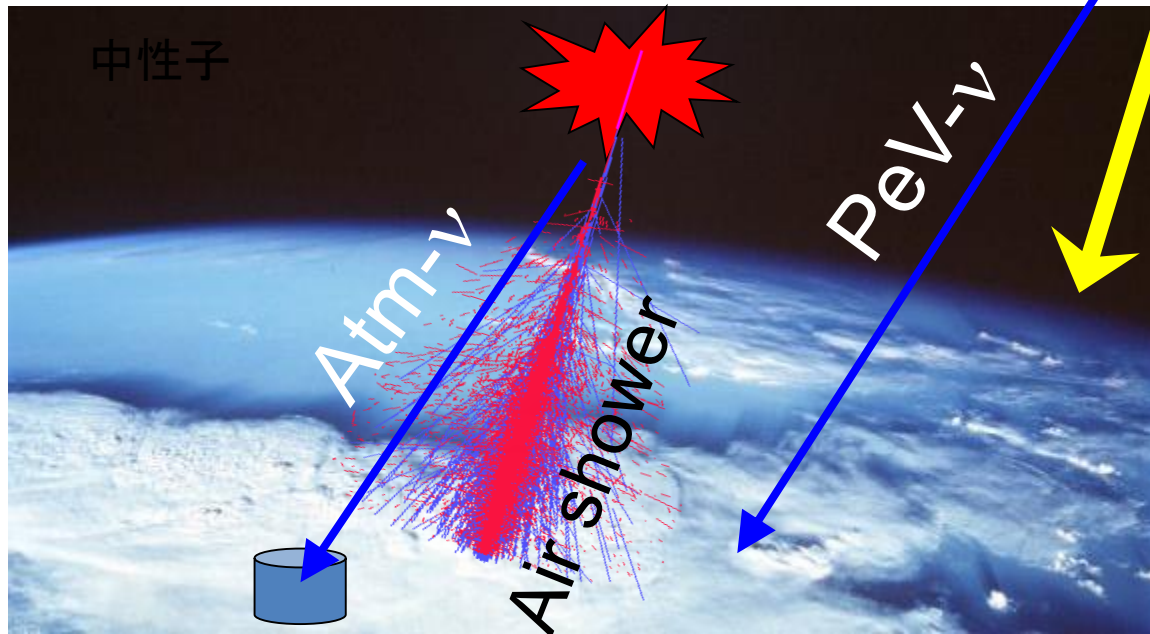
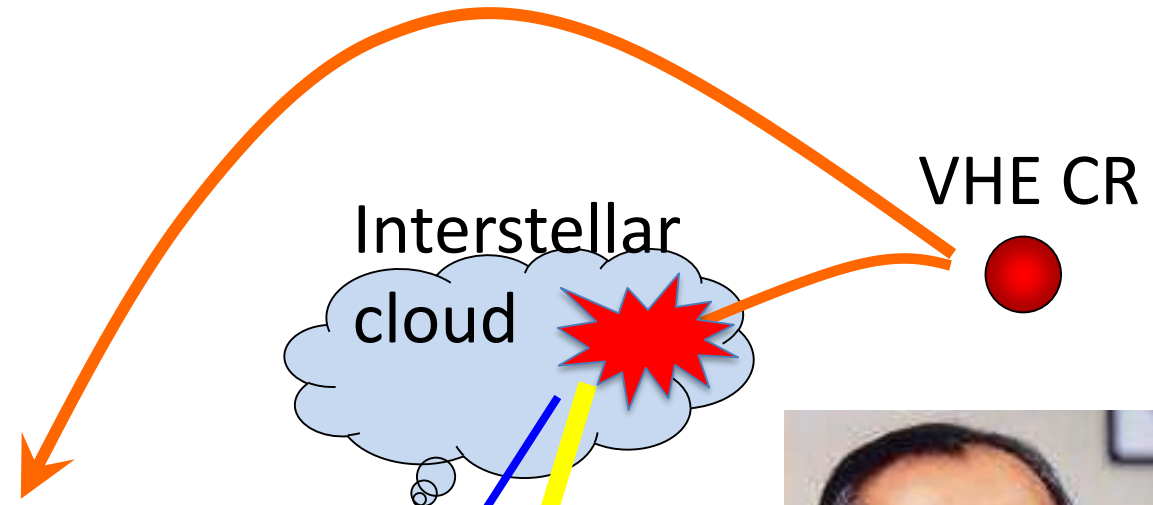
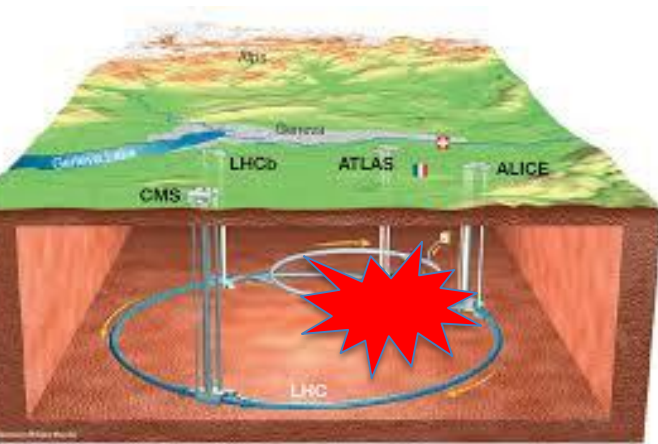
TALE

AUGER, TA



- LHC covers 10<sup>14</sup> – 10<sup>17</sup> eV cosmic rays
- LHCf measures forward particle spectra relevant to air showers.

# Next paradigm : multi-messenger era



Prof. Sachio Hayakawa  
God father of Japanese  
CR physics  
(former Nagoya president)

中性子

	21-May	22-May	23-May	24-May	25-May
	Mon	Tue	Wed	Thu	Fri
9	opening	accelerator	UHECR	model	gamma-ray
	opening	accelerator	UHECR	model	gamma-ray
10	opening	accelerator	UHECR	model	gamma-ray
	break	break	break	break	break
11	UHECR	accelerator	HECR	model	gamma-ray
	UHECR	accelerator	HECR	model	gamma-ray
12	UHECR	accelerator	HECR	model	gamma-ray
	lunch	lunch	lunch	lunch	lunch
13	lunch	lunch	lunch	lunch	lunch
	lunch	lunch	lunch	lunch	lunch
14	HECR	interaction	astro-nu	hadron	future
	HECR	interaction	astro-nu	hadron	future
15	HECR	interaction	astro-nu	hadron	future
	break	break	astro-nu	break	break
16	astro	atm-nu	break	space	future
	astro	atm-nu	public lecture	space	closing
17	astro	atm-nu	public lecture	space	closing
	astro	atm-nu	public lecture	space	
18	reception	poster	public lecture		
	reception	poster			
19	reception	poster	banquet		
	reception	poster	banquet		
20			banquet		
			banquet		



# Enjoy Nagoya, enjoy symposium !

