

•

•



**1-1**

**1-2**

3

28

3

**1-2-1**

Das Kaushik

Sarkar Dyuti Prakash

Chakraborti Tushar Mouli

,

**1-2-2**

3	4	1	Sarkar Dyuti Prakash
3	6	1	Katharina Otto
3	12	31	

**1-3**

**1-3-1**

**1-3-2**

**1-3-2-1**

19-21

5		3		2		0
5		4		1		0
	3		0		3	0
3		3		0		0
1		0		1		0

**1-3-4**

3		2		1		0
	1		0		1	0

**1-3-5**

3 9 0

3 3 12

Simultaneous measurement of elastic wave velocity and porosity of epidiosites collected from Oman ophiolite: Implication for low VP/VS anomaly in the oceanic crust

VP/VS

AI

(Detection of Deep Low-frequency Tremor Using Deep Learning)

(Precision epicenter determination of shallow very low-frequency earthquake in the Hyuganada area)

Depth profile of frictional properties of the cuttings samples obtained at the Nankai Trough IODP Site C0002

C0002

(Elucidation of crystal nucleation process in natural carbonate deposits)

C Jbilet Winselwan

(Organic cosmochemical study on Jbilet Winselwan carbonaceous chondrite for understanding the parent body process of the C-type asteroid Ryugu)

(A study on fault source models for seismic hazard analyses)

(Shock Hugoniot temperature measurements of bridgmanite)

Sr-Nd

(Study of the origin and evolution of magma from Abu volcano group using trace elements and Sr-Nd isotopes)

(Organic geochemical study on the ecosystem at terrestrial mud volcanos: Potential link with the habitability of Mars)

(Elucidation of fault formation mechanism in brittle-plastic transition regime: an example of Main Central Thrust zone, India)

Al

(Dependence of Al substitution sites on high pressure hydrous minerals)

**1-3-6**

3

5

Dey Bidisha

**1-4**

**1-4-1**

**(1)**

6 25			

--	--	--	--



(6)

	L. Cury                      A. Bahniuk	
Gwalior	P. Chakraborty	
	Dr. S. Ghosh IIT Kharagpur	
	K. Otto	
2	R. Stroud    B.T. De Gregorio  L. Nittler    G. Cody  L. Bonal    E. Quirico  L. Remusat  C. Engrand    E. Dartois    J. Mathurin J. Duprat            =	
	J. Hiller    N. Khawaja	
	G. Ghosh                      S. Bose	Das Kaushik
	A. Chattopadhyay	Das Kaushik
	B. Li	
	N. Cai	
	J. Kung	
	G. Gwanmesia	

	A.Bobrov	
	C.Xu	
	M. Wang	
Precambrian Basin	P. P. Chakraborty	Das Kaushik
South Delhi Fold Belt	A. Chattopadhyay	Das Kaushik
	S. Bose      G. Ghosh	Das Kaushik
Phan-Si-Pham	P.T. Hieu	Das Kaushik
	J. Buchen	
	L. Wang	

(7)

**JSPS-DC    JSPD-PD**

**RA**

--	--	--

km

- Sarkar D.P., Ando J., Kano A., Kato H., Ghosh G., Das K., 2021, Carbonate clumped isotope thermometry of fault rocks and its possibilities: tectonic implications from calcites within Himalayan Frontal Fold-Thrust Belt. *Progress in Earth and Planetary Science*, <https://doi.org/10.1186/s40645-021-00435-6>.
- Arai S., Hoshikawa C., Miura M., Ando J., Ishimaru S., Mochizuki N., Tamura A., Dehydrogenation of deep- - -385, <https://doi.org/10.1016/j.lithos.2021.105967>.
- Jung S., Yamamoto T., Ando J., Jung H., 2021, Dislocation Creep of Olivine and Amphibole in Amphibole Peridotites from Åheim, Norway. *Minerals*, <https://doi.org/10.3390/min11091018>.
- Nakatsuka A., Fukui H., Kamada S., Hirao N., Ohkawa M., Sugiyama K. & Yoshino T., 2021, Incorporation mechanism of Fe and Al into bridgmanite in a subducting mid-ocean ridge basalt and its crystal chemistry. *Scientific Reports* 11, 22839.
- Nakatsuka A., Yoshiasa A., Ohkawa M. & Ito E., 2022, Aluminous hydrous magnesium silicate as a lower-mantle hydrogen reservoir: a role as an agent for material transport. *Scientific Reports* 12, 3594.
- Kumar R., Kawaguchi K., Dwivedi S. B., Das K., 2022, U Pb zircon ages of pelitic and mafic granulites from Daltonganj, Chhotanagpur Granite Gneiss Complex, Eastern India: Phase equilibria modeling and tectonic implications. *Geological Journal*, 57(3), 1284-1310, <https://doi.org/10.1002/gj.4340>
- Apurva Alok, Pant N.C., Das K., Tsutsumi Y., Kumar P., Chopra S., Saini H.S., Khan A.A., 2021, New insights on the geological evolution of paleorivers and their relationship to Indus civilization and early Historic settlements on the plains of Haryana, NW India. *Quaternary Geoarchaeology of India*, Special Publications 515, Geological Society of London. <https://doi.org/10.1144/SP515-2020-161>
- Kawaguchi K., Hayasaka Y., Minh P., Das K., Kimura K., 2022, Origin and tectonic relationship of metagabbro of the Sambagawa Belt, and associated Karasaki mylonites of western Shikoku, Southwest Japan. *Geosciences Journal*, 26, 37-54. <https://doi.org/10.1007/s12303-021-0022-6>
- Shields G.A., Strachan R.A., Porter S.M., Halverson G.P., Macdonald F.A., Plumb K.A., de Alvarenga C.J., Banerjee D.M., Bekker A., Brasier A., Chakraborty P.P., Collins A.S., Condie K., Das K., Ernst R., Fallick A.E., Frimmel H., Fuck R., Hoffman P.F., Kamber B.S., Kuznetsov A., Mitchell R., Poiré D.G., Poulton S.W., Riding R., Sharma M., Storey C., Stueeken E., Tostevin R., Turner E., Xiao S., Zhang S., Zhou Y., Zhu M., 2022, Towards a new geological time scale: A template for improved

rock-based subdivision of pre-Cryogenian time, *Journal of Geological Society of London* 179, 1, 1-22 (doi.org/10.1144/jgs2020-222).

Sarkar D.P., Ando J., Kano A., Kato H., Ghosh G., Das K., 2021, Validity of calcite clumped isotope thermometry for fault rocks: Insights from calcites within Himalayan frontal Fold-Thrust Belt. *Progress in Earth and Planetary Science* 8, 42 doi.org/10.1186/s40645-021-00435-6.

Das K., Bose S., Torimoto J., Hayasaka Y., Dunkley D., 2021, Tracking C-O-H fluid-rock interactions in reworked UHT granulite: Tectonic evolution from ca. 990 Ma to ca. 500 Ma in orogenic interior of Eastern Ghats Belt, India, *Lithos.* 398-399, 106287 <https://doi.org/10.1016/j.lithos.2021.106287>

Kimura K., Hayasaka Y., Yamashita J., Shibata T., Kawaguchi K., Fujiwara H., Das K., 2021, Antiquity and tectonic lineage of Japanese islands: New discovery from U-Pb zircon geochronology. *Earth and Planetary Science Letters* 565, 116926.

Kawaguchi K., Minh P., Hieu P.T., Cuong T. C., Das K., 2021, Evolution of supracrustal rocks of the Indochina Block: Evidence from new detrital zircon U Pb ages of the Kontum Massif, Central Vietnam, *Journal of Mineralogical and Petrological Sciences*, 200916, 116, 69-82.

Bose S., Ghosh G., Kawaguchi K., Das K., Mondal A.K., Banerjee A., 2021, Zircon and monazite geochronology from the Rengali-Eastern Ghats Province: Implications for the tectonic evolution of the eastern Indian terrane. *Precambrian Research*, 355 (doi.org/10.1016/j.precamres.2020.106080)

Ganguly P., Ghosh G., Bose S., Das K., 2021, Polyphase deformation and ultrahigh temperature metamorphism of the deep continental crust: Implications for tectonic evolution of the northern Eastern Ghats Belt, India. *Journal of Structural Geology*, 143, 104250 doi.org/10.1016/j.jsg.2020.104250

\_\_\_\_\_

\_\_\_\_\_ 2021. Cs X  
2021 2021 9 16

Fukushima N. Sumino H. Ando J. Das K. Kobayashi M. Kagi H. Yamamoto T. 2021. Noble gas analysis and microstructure observation of the Finero phlogopite peridotite in Northern Italy to constrain the origin of deformation process of mantle wedge peridotite. *JpGU* 2021 2021 6 5  
Online

Sarkar D.P. Ando J. Das K. Ghosh G. 2021. Role of lithology in deformation mechanisms of shallow-crustal active faults: Evidence from the Nahan thrust of Himalayas. *JpGU* 2021 2021 6 5  
Online

- \_\_\_\_\_ Das K. Sarkar D. P. 2021. JpGu 2021 2021 6
- 5 Online
- \_\_\_\_\_ Das K. 2021. Sarwar-Junia  
JpGu 2021 2021 6 5 Online
- \_\_\_\_\_ Das K. 2021.  
JpGU 2021 2021 6 6 Online
- Ngombi Mavoungou L. Das K. Hayasaka Y. Kawaguchi K. Ando J. 2021. Tonoshiki breccia recording the signature of the closure of Maizuru back-arc basin during Permian-Triassic boundary  
2021 2021 9 18
- Sarkar D. P. \_\_\_\_\_ Das K. Ghosh G. 2021. Coalescing detrital zircon geochronology and litho-structural mapping in identification of MBT in Himachal Himalayas 2021  
2021 9 18
- \_\_\_\_\_ Das K. Sarkar D.P 2021.  
2021 2021 9 18
- \_\_\_\_\_ 2021.  
2021 2021 9 18
- \_\_\_\_\_ Das K. 2021. Sarwar-Junia  
2021 2021 9 18
- \_\_\_\_\_ Das K. 2021.  
2021 2021 9 18
- \_\_\_\_\_ Simon Hunt David Dobson 2021. MnGeO<sub>3</sub>  
62 2021 10 18
- Das K. Bose S. Ghosh G. Ganguly P. 2021. Geotranssect across south of Singhbhum Craton-Rengali Province-Eastern Ghats Province India: Multiple orogenic belts of contrasting age and tectonic evolution of Eastern Indian terrane. 2021 2021 9 18
- \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ 2021.  
2021 2021 9 18
- Das K. Bose S. Torimoto J. Hayasaka Y. Dunkley D. 2021. Evidence of carbonic crustal fluid during deep to shallow crustal evolution of the interior of Eastern Ghats Belt India: Grenvillian to Kuunga orogenies JpGU 2021 2021 6 6 Online
- Ngombi Mavoungou Larissa Das K. Hayasaka Y. Kuriu H. Kawaguchi K. 2021. Tectonostratigraphic characterization of Maizuru back-arc basin during its closure: geochemical and U-Pb detrital geochronological approaches JpGU 2021 2021 6 6 Online
- Ngombi M. L. Das K. Hayasaka Y. Kawaguchi K. 2021. Late Permian tectonic switch in Maizuru terrane: Evidence from U-Pb detrital zircon geochronology from Tonoshiki Formation  
128 2021 9 4 6 2021

TIMS  
pyrolysis-GCMS

ICP-MS  
SEM, TEM, EBSD

STXM

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

---

---

---

---

---

4867060194

---

, 221 , ISBN-10:

Noguchi T., Matsumoto T., Miyake A., Igami Y., Haruta M., Saito H., Hata S., Seto Y., Miyahara M., Tomioka N., Ishii H. A., Bradley J. P., Ohtaki K. E., Nakamura T., Matsumoto M., Tsuchiyama A., Yasutake M., Matsuno J., Okumura S., Uesugi K., Uesugi M., Takeuchi A., Sun M., Enju S., Takigawa A., Leroux H., Le Guillou C., Jacob D., Marinova M., de la Peña F., Langenhorst F., Harries D., Beck P., Phan T. H. V., Rebois R., Abreu N. M., Zega T., Zanetta P.-M., Thompson M., Lee M., Daly L., Bland P. A., Stroud R., Burgess K., Bridges J. C., Hicks L., Zolensky M. E., Frank D. R., Martinez J., Yurimoto H., Nagashima K., Kawasaki N., Okazaki R., Yabuta H., Naraoka H., Sakamoto K., Tachibana S., Watanabe S., Tsuda Y., and the Hayabusa2 Initial Analysis Team, 2021. Mineralogy and surface modification of small grains recovered from the asteroid 162173 Ryugu, Hayabusa 2021 (2021 11 16 ).





\_\_\_\_\_ 2021. 8  
\_\_\_\_\_ 2021. 2021 3 2 .  
\_\_\_\_\_ 2021. 2  
Stella Nova 2021 3 2021 11 14  
\_\_\_\_\_ 2021.  
82 2021 9 10

\_\_\_\_\_ Rafael França de Mattos  
Leonardo Fadel Cury Anelize Manuela Bahniuk 2021.  
8 128  
2021 9 4 1000  
\_\_\_\_\_ Leonardo Fadel Cury Anelize Manuela Bahniuk 2021.  
128  
2021 9 4 1000  
\_\_\_\_\_ 2021.  
128  
2021 9 4 1000  
\_\_\_\_\_ 2022.  
172 2022 3  
5 50  
\_\_\_\_\_ 2022.  
172 2022 3 5  
50  
\_\_\_\_\_ 2021.  
2021 2021 9 18

NWA 10153 NWA 6148 2021 2021. Nakhlite  
 18 . 2021 9 18  
 2021. 2021 9 18  
 2021. 2021 9  
 18 . 2021. 62  
 2021 10 18 .  
 2021. 62  
 2021 10 18 .  
 2021. The  
 petrological and mineralogical descriptions of nakhlites NWA 6148 and NWA 10153 JpGu 2021  
 2021 6 5 Online .  
 2021.  
 2021  
 2021 6 3 , .

10 23

Hatakeyama K., [Katayama I.](#), Abe N., Okazaki K., Michibayashi K., and The Oman Drilling Project Science Party. 2021. Effects of alteration and cracks on the seismic velocity structure of oceanic lithosphere inferred from ultrasonic measurements of mafic and ultramafic samples collected by the Oman Drilling Project. *Journal of Geophysical Research*, doi.org/10.1029/2021JB021923.

[Katayama I.](#), Abe N., Hatakeyama K., Akamatsu Y., Okazaki K., Michibayashi K., Godard M., Kelemen P., and The Oman Drilling Project Phase 2 Science Party. 2021. Crack geometry of serpentinized peridotites inferred from onboard ultrasonic data from the Oman Drilling Project. *Tectonophysics*, doi.org/10.1016/j.tecto.2021.22897.

Akamatsu Y., Nagase K., [Katayama I.](#) 2021. Non-dilatant brittle deformation and strength reduction of olivine gabbro due to hydration. *Minerals*, 11, 694. doi.org/10.3390/min11070694.

Akamatsu Y., Katayama I., Tonegawa T. 2021. Changes in elastic wave velocity during brittle deformation of gabbro and peridotite: Implications for oceanic Moho reflectivity. *Earth and Planetary Science Letters*, doi.org/10.1016/j.epsl.2021.117036.

Lai S.T., Fuji N., Katayama I., Bonilla L.F., and Capdeville Y. 2021. Rock deformation monitoring using Monte Carlo waveform inversion. *Journal of Geophysical Research*, doi.org/10.1029/2021JB021873.

---

2021

130 483-506.

Kita S., Houston H., Yabe S., Tanaka S., Asano Y., Shibutani T. & Suda N. 2021. Effects of episodic slow slip on seismicity and stress near a subduction-zone megathrust, *Nat Commun* 12, 7253.

Kakizawa S., Inoue T., and Kuribayashi T. Single-crystal X-ray structure refinement of Al-bearing superhydrous phase B, *Phys. Chem. Minerals*, **48**, 29, 2021. <https://doi.org/10.1007/s00269-021-01152-8>

Xu C., Li Y., Inoue T., Greaux S., Li Q., Gao J., Sun F., Fang L., Elastic properties of Mg-phase D at high pressure. *High Pressure Research*, **41(3)**, 233-246, 2021. <https://doi.org/10.1080/08957959.2021.1954177>

Cai N., Qi X., Chen T., Wang S., Yu T., Wang Y., Inoue T., Wang D. and Li B. Enhanced visibility of subduction slabs by the formation of dense hydrous phase A. *Geophysical Research Letters*, 48, e2021GL09548,2021. <https://doi.org/10.1029/2021GL095487>.

Xu C., Inoue T., Kakizawa S. and Noda M. & Gao J. Effect of Al on the stability of dense hydrous magnesium silicate phases to the uppermost lower mantle: implications for water transportation into the deep mantle. *Phys Chem Minerals* **48**, 31, 2021. <https://doi.org/10.1007/s00269-021-01156-4>.

Xu C., Kakizawa S., Gréaux S., Inoue T., Li Y., & Gao J. Al partitioning between phase D and bridgmanite at the uppermost lower mantle pressure. *Phys Chem Minerals* **48**, 37, 2021. <https://doi.org/10.1007/s00269-021-01163-5>.

Chen X., Wang M., Inoue T., Liu Q., Zhang L. and Bader T. Melting of carbonated pelite at 5.5-15.5 GPa: Implications for the origin of alkali-rich carbonatites and the deep water and carbon cycles, *Contributions to Mineralogy and Petrology*, **177(1)**, 1-21, 2022. <https://doi.org/10.1007/s00410-021-01867-5>.

Xu C., Inoue T., Gao J., Noda M. and Kakizawa S. Melting phase relation of Fe-bearing Phase D up to the uppermost lower mantle, *American Mineralogist*, **107**, 343-349, 2022. <https://doi.org/10.2138/am-2021-7907>.

Ohira I., Jackson J.M., Sturhahn

Kita S., Houston H., Yabe S., Tanaka S., Asano Y., Shibutani T. & Suda N., 2021. Relationship of in-slab events with episodic tremors and slips and detection of another slow slips near the anticipated megathrust event in the Nankai subduction zone. AGU 2021 12 15

Sho Kakizawa, Toru Inoue, Hiroto Nakano, Minami Kuroda, Takahiro Kuribayashi, Naoya Sakamoto, Hisayoshi Yurimoto, 2021. Effect of Al on stability and crystal structure of superhydrous phase B, 2021 JpGU2021 2021 6 4 .

Masamichi Noda, Toru Inoue, Taku Tsuchiya, Yuji Higo, 2021. Reassessment of bond correction for in situ ultrasonic interferometry on elastic wave velocity measurement under high pressure and high temperature, 2021 JpGU2021 2021 6 4 .

Ko Fukuyama, Hiroyuki Kagi, Toru Inoue, Sho Kakizawa, Toru Shinmei, Yuji Sano, Naoto Takahata, Shunichi Hishita, Cécile Deligny, Evelyn Füre, 2021. Increase of nitrogen solubility in ferropicrinite and bridgmanite by iron incorporation under lower-mantle conditions, 2021 JpGU2021 2021 6 4 .

Kazutaka Yamaguchi, Takaaki Kawazoe, Toru Inoue, 2021. Influence of high oxygen fugacity on melting temperature of wadsleyite, 2021 JpGU2021 2021 6 4 .

Fukuyama K., Kagi H., Inoue T., Kakizawa S., Shinmei T., Sano Y., Takahata N., Hishita S., Deligny C., Füre E., 2022. Increase of nitrogen solubility with increasing iron concentration in lower-mantle minerals: formation of deep nitrogen reservoir through solidification of magma ocean, 4th - 2022 1 17 .

Ohta A., Inoue T., Noda M., Shinmei T., Irifune T., Sakamoto N., Yurimoto H., 2022. Effect of Al on high pressure hydrous minerals stable under mantle transition zone P-T condition, 4th International - 2022 1 17 .

\_\_\_\_\_ 2021. 2021  
2021 6 1 , .

\_\_\_\_\_ 2021.  
2021 9 16 , .  
\_\_\_\_\_ 2021.

2021 9 16 , .  
\_\_\_\_\_ 2021. C0002  
2021 9 16

, .

2021.

2021 9 4 ,

2021. Oman Drilling Project Phase I Science Party Vein permeability structure of the crustal section in the Oman Drilling Project inferred from the X-ray CT image analysis 2021 2021 6 1 , .

2021.

2021

2021 6

1 , .

2021. Frequency characteristics of acoustic emission in the fracture process of thermally cracked granite 2021 2021 6 1 , .

2021. Frictional coefficient and its velocity dependence of cuttings retrieved from the Nankai accretionary prism at IODP Site C0002 2021 2021 6 1 , .

2021.

-

:

2021

2021 6

1 , .

2021.

2021 2021 6 1 , .

Houston Heidi

2021.

Effects of ETS on seismicity and stress in the subducting oceanic plate. 2021

2021 6 3 , .

2021.

2021

2021 6 5 , .

Houston Heidi

2021.

2021. Mg<sub>2</sub>SiO<sub>4</sub>

2021 2021 9 16 , .

2021. (Mg,Fe)<sub>2</sub>SiO<sub>4</sub> 2021 2021 9  
16 , .

2021. 2021 2021 9  
16 , .

Al

2021 9 16 , .

2021. 2021

2021 9 16 , .

2021.

62 2021 10 18 .

2021. Mg<sub>2</sub>SiO<sub>4</sub>

62 2021 10 18 .

2021. (Mg Fe)<sub>2</sub>SiO<sub>4</sub> 62 2021  
10 18 .

2021. 9  
2021 11 26 .

**1-4-3**

**1-4-4**

3

B 2021-2023

JSPS-DST

DST 2019-2022

A 2018-2021

Das Kaushik 2

B 2020-2022

B 2021-2023

1

B 2020-2023

7

B 2019-2023

3

2021-2023

2020-2021

A 2020-2024

A 2019-2023

C 2019-2023

5

B 2020-2022

2021-2023

FIB

B 2018-2021

B 2019-2022

X

C 2021-2023

Relationship between crustal

degassing and microbial mineralization in active mud volcanoes hydrocarbon seeps and other environments

4

B 2020-2021

S

S 2018-2022



A 2020-2022

B 2020-2023

3

A 2020-2023

A 2018-2021

C 2020-2022

4

A 2018-2021

B 2019-2023

2021-2022

B 2021-2024

3

B 2019-2024

X

B 2019-2023

A 2020-2024

3

2017-2021

B 2021-2024

B 2019-2023

4

2019-2021

Fe

2020-2022

S 2018-2022

B 2019-2023

1

C 2020-2022

3

Spring-8

SPring-8

SPring-8 J-PARC

**1-4-5**

Das Kaushik

The Meteoritical Society Publication Committee

Astrobiology

Biospheres

IODP

Sedimentary Geology

New Space

Origins of Life and Evolution of

J-

PARC MLF

PF

**1-5**

	2022	3						
X	258	2022	1	9				
2								
	5up	2021	3	17	3	16	M7.4	
	2021	9	17				21	8

16

DAS Kaushik

Chakraborti Tushar Mouli  
Katharina Otto

Sarkar Dyuti Prakash

3	4	1	Sarkar Dyuti Prakash
3	6	1	Katharina Otto
3	12	31	

**2-3-1**

1                      24

**2-3-2**

1 2

4

**2-3-3**

**2-3-3-1**

2 3

1 2 3

4

**2-3-3-2**

3

22

16

12

4

5

**2-3-4**

3

9

0

3

3

22

(Microstructural observation of sheared coaly mudstone developed in the Triassic Nariwa Group)

(Simultaneous measurements of resistivity, seismic velocity and porosity of Aji granite during triaxial deformation experiments)

HCN

(Morphology and size distributions of HCN polymers in a simulated environment of icy celestial bodies)

cleavable olivine

(Formation process of cleavable olivine found in Takadomari ultramafic rock in the Kamuikotan belt)

(The relationship between Wadsleyite Rupture Strength and the Number of Deep Earthquakes)

(Development of a numerical model simulating seismic anisotropy using a finite deformation theory)

Investigation of the collisional history of asteroid 4 Vesta based on U-Pb chronology of HED meteorites

HED

(Elucidation of Arctic Martian analog environment based on in-situ Nitrogen chemical speciation)

(Microstructure, chemical composition and magnetic property of magnetite in serpentinite from Saganoseki, Oita city, Oita Prefecture, Japan, and in basic rock from the Mt. Rakan, Hatsukaichi City, Hiroshima Prefecture, Japan)

(Simultaneous measurements of resistivity, seismic velocity and porosity of mafic samples collected from the Oman ophiolite during hydrostatic compressional experiments)

(Effects of shock pressure on microstructure and chemical composition of zircon grains contained in granite from Chicxulub crater)

CM

(Observation of the impact metamorphic texture of CM carbonaceous chondrites and discussion of the impact metamorphism in the parent body)

(Development of a numerical simulation code for the thermal convection in a fluid with inertia)

(Determination of source parameters of shallow very low-frequency earthquakes in the Hyuga-nada region)

(Depositional environment of banded iron formations in the Orosirian Gwalior Group, India)

(Effect of iron on the post-spinel transition under anhydrous and hydrous conditions)

(Melting experiment of hydrous mantle under mantle transition zone condition)

(Origins of spherulites observed in reefal microbial crusts in Kumejima, Okinawa)

(Establishment of in-situ nitrogen chemical speciation for elucidation of the surface environmental history on Mars)

ETAS

(ETAS model analysis of long-term seismic activity in the western Nankai subduction zone)

CI

(Shock metamorphism of CI carbonaceous chondrites on their parent bodies based on shock recovery experiments)

**2-3-5**

リテラシー  
医療情報リテラシー

1・2 1  
1・2 1

A  
祭

1・2 1

管組織論

1・2 1  
2 1

技法

1・2 1  
1・2 1  
1・2 1



1

30

(1) 30  
2 1

(2) 3 1

(3) 1 2 25

A 18 11 B 7

2

( )  
1 1 2 2 1 2 1 2 1 2



2	3
---	---

4

7 8  
A

B 108 128

A

24

84

52  
8

5

3

3

3

