



**COMMISSION ON THE CHEMISTRY OF VOLCANIC GASES (CCVG) – IAVCEI  
11<sup>TH</sup> GAS WORKSHOP, KAMCHATKA, RUSSIA  
1-10 SEPTEMBER 2011**



**Web site**

**[http://vulcanologia.uda.cl/index\\_archivos/ccvg\\_main.htm](http://vulcanologia.uda.cl/index_archivos/ccvg_main.htm)**

## FOURTH CIRCULAR

In this fourth circular we inform you about conference details (talks and poster), field trips complementary info and the final workshop program. See you soon in Kamchatka!

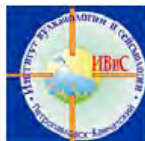
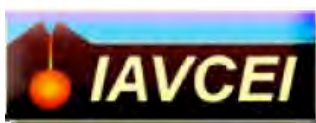
## IMPORTANT NOTES

### CONFERENCE

1. The talks will be 15 minutes, with 5 minutes for questions and discussion.
2. Poster dimensions must be 120 cm x 90 cm (portrait, not landscape).

### MUTNOVSKY VOLCANO FIELD TRIP

September in Kamchatka is one of the best periods but there is no guaranty that we will not have a fog, cold, rain or even the first snow blizzard. Temperature 5-15°C. Rainfall is quite probable. Humidity >80%. Windy. The path for Mutnovsky is wet, crossing many small streams with very cold water. Entering the crater the path crosses a snowfield. In the crater everybody must be very careful and have to use a stick: boiling mud pools, fragile sulfur cones with pools of sulfur melt beneath, a glacier with a mobile water-saturated moraine. A slope with potential rock falls. Fumaroles in the main crater are 100-300°C, some of them with a strong smell. Hot fumaroles with temperature >400°C (2010) are located in so-called Active Funnel. This is about 20





minutes climbing up from the main crater and then ~ 60 m climbing down using a rope and a gas mask. The gas mask can be of the small ones with two cartridges; but this is up to you.

**About the clothes: It's necessary to bring trekking boots; you can also bring rubber boots. For clothing you should bring a warm waterproof coat, as well as trousers of the same kind, a woollen hat, and gloves. There is no need to bring special alpinist equipment.**

## FINAL PROGRAM

### THURSDAY, 1 SEPTEMBER

Arrival of participants in the Petropavlovsk airport, transfer to Petropavlovsk-Kamchatsky and check-in in Geysir Hotel

**19:00 hrs**

Icebreaker

### FRIDAY, 2 SEPTEMBER

**7:30 hrs**

Breakfast in Geysir Hotel

**8:30 – 9:00 hrs (O1)**

Opening Ceremony

Y..Taran

Volcanic gas geochemistry. A Russian connection

### ORAL SESSION

**Remote sensing (Chairs: Ulrich Platt, Nicole Bobrowski)**

**9:00 – 9:20 hrs (O2)**

B. Galle, U. Platt, M. Van Roozendaal, C. Oppenheimer, T. Hansteen, G. Boudon, M. Burton, H. Delgado, A. Muñoz, E. Duarte, G. Garzón, D. Escobar, M. Kasareka, L. Molina, S. Carn, S. Hidalgo, E. Sánchez, S. Inguaggiato

NOVAC–Network for Observation of Volcanic and Atmospheric Change, recent developments and present status

**9:20 – 9:40 hrs (O3)**

U. Platt, N. Bobrowski, B. Galle

Spectroscopic Observation of Volcanic Emissions – Status and Future Trends

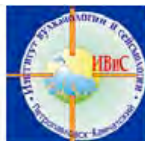
**9:40 – 10:00 hrs (O4)**

S. Arellano, B. Galle

New developments on remote sensing studies of volcanic gas emissions by solar infrared spectroscopy

**10:00 – 10:20 hrs (O5)**

N. Bobrowski, L. Vogel, G. Giuffrida, C. Hoermann, F. W. Klappenbach, P. Luebcke, M. Liuzzo, S. Calabrese, M. Liotta, D. Tedesco, H. Delgado, J. Alvarez, A. Munoz, E. Jaekel, R. von Glasow, U. Platt  
Can BrO/SO<sub>2</sub> be used as a tracer of volcanic activity?



**10:20 – 10:40 hrs (O6)**

G. Tamburello, A. Aiuppa, E.P. Kantzas, A.J.S. McGonigle, M. Ripepe  
High temporal and spatial resolution UV camera measurements at Stromboli: insights on passive SO<sub>2</sub> gas emission, Strombolian eruptions, and puffing.

**10:40 – 11:00 hrs *Coffee Break*****11:00 – 11:20 (O7)**

O. Neussypina, H. Fischer, A. Krueger, P. Rusch, R. Harig, D. Melnikov  
Remote sensing of volcanic gas emissions using a scanning imaging UV-spectroscopy system and tomographic 3D cloud reconstruction

**11:20 – 11:40 hrs (O8)**

R. Campion, G. Pinardi, PF. Coheur, G. Salerno, M. Burton, H. Delgado-Granados, M. Martinez-Cruz, S. Carn, A. Bernard  
Comparing and integrating SO<sub>2</sub> measurements from ground and space

**11:40 – 12:00 hrs (O9)**

T. Lopez, S. Ushakov, P. Izbekov, C. Werner, C. Cahill, S. Carn  
Characterization and interpretation of volcanic activity at Bezymianny volcano from 2007 through 2010: A volcanic-gas perspective

**12:00 – 12:20 hrs (O10)**

C. Ramírez, R. Mora, G. González  
Field Thermal Imaging monitoring of fumaroles, crater lakes and mud pools, at Costa Rican Volcanoes

**Direct sampling (*Chairs: Giovani Chiodini, Tobias Fisher*)****12:20 – 12:40 hrs (O11)**

F. Aguilera, F. Tassi, O. Vaselli, T. Darrah  
Geochemical and isotopic survey of fluid discharges from northern Chile volcanoes

**12:40 – 13:00 hrs (O12)**

G. Chiodini, S. Caliro, R. Avino, C. Minopoli  
The fumaroles of Solfatara crater (Campi Flegrei): thirty years of chemical and isotopic compositions

**13:10 – 14:10 hrs *Lunch time*****14:20 – 14:40 hrs (O13)**

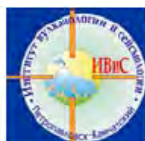
O. Vaselli, F. Tassi, D. Tardani, E. Fernandez, E. Duarte  
A discontinuous geochemical and isotopic monitoring at the Poàs magmatic/hydrothermal system

**14:40 – 15:00 hrs (O14)**

T. Fischer  
Gas discharges from Continental Rift Volcanoes: Case Study of Oldoinyo Lengai Carbonatite-Nephelinite System

**15:00 – 15:20 hrs (O15)**

I. Chaplygin  
Magmatic degassing and ore-forming processes at Kudriavy volcano (Kuriles, Russia)





**15:20 – 15:40 hrs** *Coffee Break*

**15:40 – 17:20 hrs**

**Poster Session** (*Chairs: Lizzette Rodriguez, Orlando Vaselli*)

**17:20 – 18:30 hrs**

**Discussion Session** (*Chairs: Bo Galle, Yuri Taran*)

**19:00 hrs**

Dinner in Geysir hotel

## **POSTER SESSION**

### **Remote sensing**

#### **(P1)**

R. Campion, A. Bernard

Measuring SO<sub>2</sub> emissions of Eyjafjallajökull with the infrared images of ASTER satellite

#### **(P2)**

D. Melnikov, S. Ushakov

SO<sub>2</sub> gas emission of Mutnovsky and Gorely volcanoes (Kamchatka): satellite data and ground-based observations

#### **(P3)**

L. Rodríguez, C. Reyes, D. Gaetán, G. Chigna, C. Ramírez, R. Mora, G. Gonzalez

OMI SO<sub>2</sub> measurements of active volcanoes in Guatemala and Costa Rica

#### **(P4)**

S. Illing, P. Lübcke, N. Bobrowski, L. Vogel, U. Platt

Volcanic plume observations with a SO<sub>2</sub> camera at Popocatepetl and Colima, Mexico

#### **(P5)**

L. Vogel, N. Bobrowski, VR. Cáceres-Espinosa, C. Kern, C. Hörmann, R. Von Glasow, U. Platt

Understanding BrO formation in volcanic plumes, measurements of plume chemistry at early plume ages

### **Direct sampling**

#### **(P6)**

F. Aguilera, O. Benavente, F. Gutierrez, M. Agosto, A. Caselli

Distribution of gas-water discharges and current geochemical survey along Planchon-Peteroa-Azufre Volcanic Complex, southern Chile

#### **(P7)**

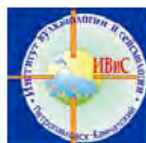
L. Peiffer, Y. Taran, D. Rouwet

Gas geochemistry of El Chichón volcano

#### **(P8)**

HF. Lee, T.F. Yang, TF. Lan, HY. Wen, CC. Lin

Temporal variations of gas compositions of fumaroles in the Tatun Volcano Group, northern Taiwan



**(P9)**

N.A. Ozerova, A.Yu. Ozerov

Mercury in fumarolic gases and mud pools of the Mutnovsky crater

**(P10)**

A.P. Maximov, P.P. Firstov, I.I. Chernev, V.N. Shapar

Gas composition in Mutnovsky geothermal field: Role of meteoric water

**(P11)**

R. Mora, C. Ramírez, G. González, D. Rouwet, A. Rojas

Laguna Caliente, Poás Volcano, Costa Rica: The most active hyperacid crater lake of the world (2006-2011)

**(P12)**

E. Bagnato, M. Pistolesi, A. Aiuppa, A. Bertagnini, C. Bonadonna, R. Cioni, M. Pedone

Leachate analyses of volcanic ashes from the 2010 Eyjafjallajökull eruption

**SATURDAY, 3 SEPTEMBER****7:30 hrs**

Breakfast in Geyser Hotel

**ORAL SESSION****DCO and carbon species measurements (Chairs: Jesse Ausubel, Alessandro Aiuppa)****8:30 – 8:50 hrs (O16)**

J. Ausubel

The New International Deep Carbon Observatory

**8:50 – 9:10 hrs (O17)**

E. Hauri

Grand Challenges in the Deep Earth Carbon Cycle

**9:10 – 9:30 hrs (O18)**

A. Aiuppa, M. Burton, P. Allard, T. Caltabiano, G. Giudice, S. Gurrieri, M. Liuzzo, G. Salerno

Linking plume CO<sub>2</sub> flux emissions and eruptive activity at Stromboli volcano (Italy)**9:30 – 9:50 hrs (O19)**

H. Pfanz

Volcanic CO<sub>2</sub> emission and indicative vegetation**9:50 – 10:10 hrs (O20)**

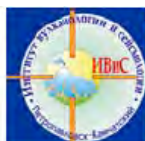
F. Tassi, J. Fiebig, M. Nocentini, O. Vaselli

Origin of methane in fluid discharges from Italian volcanic and hydrothermal systems as inferred by the isotopic features and the chemical composition of light hydrocarbons

**10:10 – 10:30 hrs (O21)**

J. Fiebig, F. Tassi, W. D'Alessandro, O. Vaselli, A. Woodland

Short chain hydrocarbons in Mediterranean hydrothermal systems: origins and geothermometry





**10:30 – 10:50 hrs *Coffee Break***

**Multidisciplinary and applied gas studies (Chairs: *Dario Tedesco, Patrick Allard*)**

**10:50 – 11:10 hrs (O22)**

B. Christenson, A. Mazot, K. Britten, J. Cole-Baker

Magmatic gas transfer through Ruapheu Crater Lake: Insights into transfer processes and P-T-X conditions in the vent environment

**11:10 – 11:30 hrs (O23)**

P. Allard, A. La Spina, G. Tamburello, A. Aiuppa, A. Di Muro, M. Burton, T. Staudacher

First measurements of magmatic gas composition and fluxes during an eruption (October 2010) of Piton de la Fournaise hot spot volcano, La Reunion island

**11:30 – 11:50 hrs (O24)**

T. Hansteen, S. Bredemeyer, K. Garofalo, P. Peña, Y. Dzierma, W. Rabbel, K. Bataille, F. Gil

Gas monitoring and seismicity at Villarrica Volcano, Chile

**11:50 – 12:10 hrs (O25)**

D. Tedesco, F. Tassi, O. Vaselli, T. Darrah, R.J. Poreda, N. Bobrowki, E. Cuoco

The Virunga volcanic active area: A complete (almost) geochemical approach to mitigate volcanic and other hazards

**12:10 – 12:30 hrs (O26)**

A.Yu. Ozerov

Gas regime defining the mechanism of periodic lava fountaining of basaltic volcanoes (experimental modeling)

**12:30 – 12:50 hrs (O27)**

A.V. Kiryukhin, T.V. Rychkova, I.K. Dubrovskaya

iTOUGH2-EOS3 modeling of the natural state of the Geysers Valley hydrothermal system (Kronotsky Nature Reserve, Kamchatka) preceding of the Giant Landslide

**12:50 – 13:10 hrs (O28)**

Y. Taran

Review of the last 5 years volcanic gas papers: where we are and where we go?

**13:20 – 14:20 hrs *Lunch time***

**14:30 – 16:00 hrs**

**Poster Session (Chairs: *Franco Tassi, Jens Fiebig*)**

***Coffee Break* (during the poster session)**

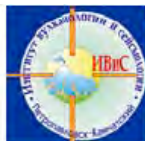
**16:00 – 16:50 hrs**

**Discussion Session (Chairs: *Bruce Christenson, Erik Hauri*)**

**16:50 – 17:10 hrs**

F. Aguilera

A story about the previous workshop



**17:10 – 18:30 hrs**

Proposals and decision for the next IAVCEI-CCVG gas workshop volcanoes and country  
Election of new CCVG officers

**19:00 hrs**

Dinner in Geysir hotel

**POSTER SESSION****DCO and carbon species measurements****(P13)**

C. Cardellini, G. Chiodini, S. Caliro, R. Avino, D. Granieri, C. Monopoli, F. Frondini, A. Baldini, M. Donnini  
1998-2010 more than ten year of CO<sub>2</sub> flux measurement at Solfatara of Pozzuoli (Italy)

**(P14)**

M. Liuzzo, G. Giudice, G. Giuffrida, S. Gurrieri  
CO<sub>2</sub> flux time variations on Mt. Etna (Italy) measured by ETNAGAS soil gas network

**(P15)**

C. Silva, F. Viveiros, T. Ferreira, JL. Gaspar, P. Allard  
<sup>222</sup>Rn and CO<sub>2</sub> soil diffuse degassing pattern anomalies and its relation with volcano-tectonic structures at Furnas Volcano (Azores, Portugal).

**(P16)**

F. Viveiros, C. Cardellini, T. Ferreira, S. Caliro, C. Silva, G. Chiodini, JL. Gaspar  
CO<sub>2</sub> hydrothermal emissions and thermal energy released at Furnas Volcano (São Miguel Island, Azores archipelago). Inferences on geomorphology and tectonics

**Multidisciplinary and applied gas studies****(P17)**

SV. Ushakov, AA. Ovsyannikov, VN. Shapar, IF. Timofeeva  
Gas monitoring of Kamchatkan volcanoes (Russia)

**(P18)**

S. Hidalgo, A. Steele, J. Bourquin, M. Ruiz, B. Galle  
Correlation between SO<sub>2</sub> fluxes and acoustic energy related to explosive activity at Tungurahua volcano (Ecuador)

**(P19)**

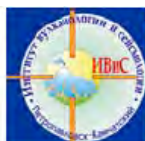
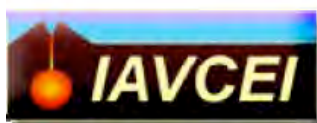
HY. Wen, TF. Yang, Z. Guo, CC. Fu, M. Zhang  
Gas composition and soil CO<sub>2</sub> flux at Changbaishan intra-plate volcano, NE China

**(P20)**

S. Calabrese, W. D'Alessandro, F. Parello, S. Bellomo, L. Brusca  
Active biomonitoring (moss-bags) of volcanic emissions on Mt. Etna

**(P21)**

G. Giudice, M. Liuzzo, G. Giuffrida, S. Gurrieri  
Example of volcanic gas composition measurements with multi-sensor integrated network





### SUNDAY, 4 SEPTEMBER

**7:30 hrs**

Breakfast in Geysir

**8:30 hrs**

Leaving Petropavlovsk for Rodnikovaya Spa

**12:00 hrs**

Accommodation at Rodnikovaya, lunch, dinner, excursion, discussions, sampling bubble gases (high  $R_n$ ,  $R/R_a=8.1$ , 1983 data) from thermal springs

### MONDAY, 5 SEPTEMBER

**6:30 hrs**

Breakfast

**7:30-9:00 hrs**

Driving to Mutnovsky

**9:30-17:00 hrs**

Sampling and remote measurements at Mutnovsky

**18:00 hrs**

Back to Rodnikovaya, dinner

### TUESDAY, 6 SEPTEMBER

**6:30 hrs**

Breakfast

**7:30 hrs**

Driving to Mutnovsky volcano and Mutnovsky geothermal field

**9:00-18:00 hrs**

Diffuse degassing measurements at the geothermal field, remote measurements at Mutnovsky and Gorely

**18:00 hrs**

Back to Rodnikovaya, Dinner

### WEDNESDAY, 7 SEPTEMBER

**7:30 hrs**

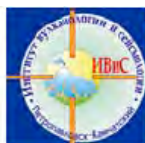
Breakfast

**8:30 hrs**

Returning to Paratunka, accommodation in the hotel Flamingo

**13:00 hrs**

Lunch





**14:00 – 17:30 hrs**

Activities will be confirmed

**18:00 hrs**

Dinner

### THURSDAY, 8 SEPTEMBER

Reserve day. May be used for excursions (Petropavlosk-Kamchatsky, Petropavlovsk Bay, foots of Koryak and Avacha volcanoes) or for discussions and seminars in the Institute of Volcanology & Seismology.

### FRIDAY, 9 SEPTEMBER

**8:00 hrs**

Breakfast in Flaming

**10:00 – 17:30 hrs**

Helicopter trip for Karymsky volcano; remote measurements, sampling of thermal springs

**20:00 hrs**

Farewell Party in Flamingo

### SATURDAY, 10 SEPTEMBER

**8:00 hrs**

Breakfast in Flamingo

Departures or helicopter excursions for Klyuchevskoy group of volcanoes

