

**GEOLOGY OF THE AINO PLANITIA QUADRANGLE (V46):
RELATIVE TIMING OF TECTONISM AND VOLCANISM;** Ellen R. Stofan¹ and
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The Aino Planitia quadrangle (V46) extends from 25°S to 50° latitude, and from 60° to 90° longitude. The surface altitude in this region, which lies on the western end of Juno Chasma and to the south of Ovda Regio, varies from approximately 2 km above Mean Planetary Radius (MPR, 6051.84 [1]) to over 1.5 km below MPR. The quadrangle contains one major shield volcano, Kunapipi Mons, and eight coronae (Nishtigri, Aramaiti, Ohogetsu, Copia, Indrani, Cailleach, Makh and Khotun Coronae) (Fig. 1). The corona range in size from 175 to 640 km. All are classified as Concentric coronae except Copia, which is an Asymmetric corona [2]. In this abstract, we review the general geology of the region, the stratigraphy, and discuss the implications for the sequence of volcanic and tectonic activity in this region.

Aino Planitia is dominated by low-lying uniform plains unit, characterized by NE-trending wrinkle ridges and numerous small volcanic edifices including shields, domes and cones. A group of four, large (> 25 km diameter) steep-sided domes lies at 34.5°S, 68°. The uniform plains unit embays several small outcrops of highly deformed terrain and high-standing regions of more deformed, mottled plains. The uniform plains unit also embays a rift segment located on the western margin of the map (Fig. 1, rift B).

Kunapipi Mons has a diameter of approximately 600 km, and is approximately 2.0 km high. Assuming an approximately conical shape yields a volume of about $2 \times 10^5 \text{ km}^3$. This is similar to volumes associated with other venusian rift-related shields. Ozza Mona has a volume of $3.0 \times 10^5 \text{ km}^3$; Theia Mons has a volume of $1.6 \times 10^5 \text{ km}^3$ [3]. This volcano is extremely large in comparison to terrestrial rift-related volcanoes; Kilimanjaro has a volume of approximately $5 \times 10^3 \text{ km}^3$ [4].

Juno Chasma is an extensive trough system extending to the east from Artemis Chasmata/Corona characterized by depths of over 1.5 km below MPR and linear fractures interpreted to be normal faults produced by extension and rifting. In the Aino Planitia quadrangle, the rift appears in two segments (Fig. 1, JCa and JCb), separated by Kunapipi Mons which is superposed on Juno Chasma. The rift then cuts across the plains. At Copia Corona, in the center of the quadrangle, the rift is manifested as a trough extending along the northern rim of the corona. At the western margin of Copia Corona lies another trough with associated faulting (Fig. 1, rift A), which is in turn linked to another rift segment (Fig. 1, rift B). We interpret the two segments of Juno Chasma (JCa and JCb) to have formed synchronously, and to have been subsequently overlain by deposits from Kunapipi Mons. Flows from this large edifice clearly flow down segments of the trough and overlie all faulting.

The formation of Copia Corona has overlapped in time with the formation of Juno Chasma, with flows from the corona superposed on segments of the trough and obscuring some faulting, while other faulting cuts the corona. The formation of rift segment A also was coeval with Copia Corona. Rift segment A breaches the rim of the corona, but flows originating from within the corona are superposed on rift faults. To the south of the corona and to the east of rifts A and B lies a plateau (Fig. 1, "P"), which predates both the rift systems and the corona. The plateau is an uplifted

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region of uniform plains. The other coronae in the region have had complex evolutions, and in all cases appear to postdate formation of the uniform plains.

In summary, rift formation and corona formation have overlapped in time in Aino Planitia, similar to the relationship between corona formation and rifting observed along other chasmata on Venus [5-7]. Other coronae in Aino Planitia have formed subsequent to the formation of the uniform plains, indicating that, although they are significant sources of volcanism, they are not responsible for the emplacement of the regional plains unit.

References: 1) P.G. Ford and G.H. Pettengill (1992) *JGR*, 97, 13,103.; 2) E.R. Stofan *et al.* (1992) *JGR*, 97, 13,347.; 3) E.R. Stofan *et al.* (1995) *JGR*, in press.; 4) C. Downie and P. Wilkinson, (1972) *The Geology of Kilimanjaro*, J.W. Northern Ltd., 253 pp.; 5) G. Baer *et al.* (1993) *JGR*, 99, 8355.; 6) V.E. Hamilton and E.R. Stofan (1995) *Icarus*, in press.; 7) E.R. Stofan *et al.*, (1995) *Venus II*, in review.

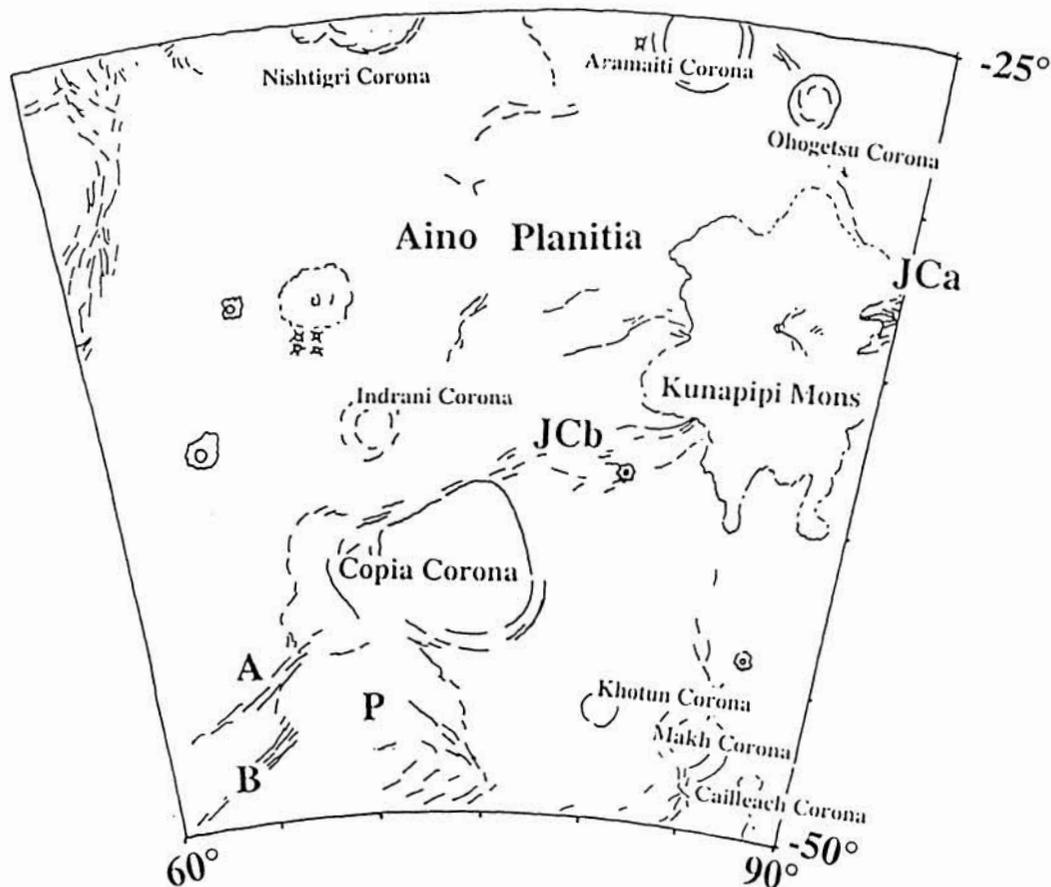


Fig. 1. Geomorphologic Map of V46 Quadrangle