volcanos such as Kilaue, Hawaii. The overlapping spreading center between the Cleft and Vance Segments on the southern Juan de Fuca Ridge shows numerous ridge-parallel fractures, which are known to be associated with the emission of hydrothermal fluids. The southern flank of Axial Volcano can be interpreted as representing the interaction of normal seafloor spreading processes with flank volcanism associated with the volcano. Careful examination of these images can reveal cross-cutting relationships and therefore provide relative dating of discrete tectonic and volcanic events. Detailed visual observations from manned submersibles and bottom photography indicate that valid inferences can be derived from these combined sonar imaging techniques to allow the interpretation of geologic processes over broad areas of the ridge crest.

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Late Proterozoic Plate Tectonic Evolution of the Dom Feliciano Belt of Southern Brazil and Uruguay

The Dom Feliciano Belt occurring on the Atlantic coast of South America in Southern Brazil and Uruguay has a northeast-southwest trend, and is the South American counterpart of Damara, Gariep, and Saldenia African belts.

The stratigraphical, paleogeographical, structural, petrological, and geochemical studies in this belt suggest that its evolution is related to the birth and death of a Late Proterozoic Ocean—Adamastor Ocean—in six stages.

1. (1.3–1.2 Ga): Rifting stage of the western Gondwanic plate with an east-west-trending doleritic dike swarm intruded in the Rio de La Plata plate.

2. (1.2–0.9 Ga): Oceanic stage and evolution of a shelf sequence (limestone-quartz sandstone-K-pelites-basic volcanics) in a passive margin of the Rio de La Plata plate.

3. (0.9–0.8 Ga): B-Subduction stage of the Adamastor Oceanic plate under the Rio de La Plata continental lip, with the generation of: (1) I-type Cordilleran granitic suite (diorite, quartz diorite, and tonalites) in a magmatic arc environment; (2) andesitic volcanogenic flysch in a fore-arc basin; and (3) pelitic flysch-acid volcanic intercalations (rhyolites and dacites) in a back-arc basin.

4. (0.8–0.7 Ga): Continental collision with piling up of divergent nappes; generation of S-type granitic suite; formation of a fore-deep basin between the belt and the craton with the beginning of late-stage marine-terrigenous flysch.

5. (0.7–0.6 Ga): Late collision stage with later folding, S- and I-type granite generation; cratonic border reactivation (shoshonitic plutono-volcanic complexes); infilling of fore-deep basin with later marine flysch and precocious continental molasse.

6. (0.6–0.5 Ga): Postcollisional stage with germanotype structuration of the belt, posttectonic I- and A-type granitic intrusions associated to faults (both in the belt and the craton and graben formation with late continental molassic sedimentation).

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Stratigraphic Lexicon of Cuba

During 1959, the stratigraphic lexicon of Cuba appeared for the first time as a part of the International Stratigraphic Lexicon. Its editors were R. Hoffsletter and P. J. Bermúdez. The names of stratigraphic units there described were comparatively brief due in part to the absence of information because the geological reports of the foreign oil companies stayed well kept in archives, months before their transfer to the Cuban partrimony. On the other hand, geological research has not even reached its acme. Furthermore, in that time there was no guide or formal methodology made by the IUGS, existing diversity of criteria for describing stratigraphic units.

As a result of the great development reached by geological research in our territory, it was necessary to bring the Lexicon up to date and to adopt a standard in describing new stratigraphic units. For this reason the Cuban Stratigraphic Lexicon Commission (CLEC) was created in the Geological and Paleontological Institute of the Academy of Sciences of Cuba (actually belonging to the Ministry of Basic Industry) with the complex task of elaborating a new Lexicon. Due to absence of English information on other types of units it was decided to describe only the lithostratigraphic units.

With only a few changes, the Commission adopted the Cuban version of the International Stratigraphic Guide. Among these changes were the use of generic lithological names only for informal units (vgr. conglomerado Camaroncito), (Yucayo, etc.).

With this task concluded, the arbitrary and anarchical use of stratigraphic names and units in a moment characterized by the proliferation the synonymies and incomplete descriptions, not being adjusted to a formal standard. This situation hindered geologic communication and the uniformity in geologic cartography.

The present Lexicon embraces the Cuba version of the Guide as a normative body, an introduction characterizing the five geologic systems recognized in Cuba and a short history of the Cuban stratigraphy, the descriptive catalogs (one for each system) with a uniform model in agreement with the Guide rules and separated bibliographies (one for each system). Each system constitutes an independent chapter. Furthermore, the Lexicon contains annexed charts of correlations (five in total) different indexes and a well-established lithologic symbology according to practice and general use. All these parts confer to the Lexicon an indubitable practical character as a book of reference.

The total units adopted here (groups, formations, members, and informal units) are 328, an estimable reduction of those existing in the past.

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Ridge Belts on Venus: Morphology, Distribution and Origin

Ridge belts on Venus, first noted by Barsukov et al (1986) in the radar images from Venera 15/16, were described as similar to wrinkle ridges on other terrestrial planets and interpreted as compressional structures (Barsukov et al, 1986; Basilevsky et al, 1986). Since then, Kryuchkov, (1988) has proposed a classification scheme based on the morphology and spacing of ridges in a ridge belt, and Sukhanov (1987) and Sukhanov and Pronin (1987, 1988, in press) have proposed that they represent extensional features resembling spreading features on Earth. We have studied the morphology of ridge belts on large and small scales, continued classifying ridge belts based on Kryuchkov's scheme (Frank and Head, 1988), and correlated the position of ridge belts to Pioneer Venus topography. Here we will focus on the theories for formation of the ridge belts.

Description: Ridge belts are distinguished by closely spaced, linear to sinuous, parallel to subparallel ridges arranged in a sinuous band. Most of these ridges have a distinct bright-dark pattern with a sharp contact between the bright radar-facing and dark away-facing slopes. Ridges within belts tend to be 3-15 km wide and 10-200 km long (Barsukov et al, 1986), and are either directly adjacent to each other or separated by mottled, grey plains. Within ridge belts, *localized plains units* from several kilometers to hundreds of kilometers wide are bounded by arcuate ridges, forming eliptical-shaped plains region reminiscent of augen in gneissic metamorphic fabric (Frank and Head, 1988). In places *linear features* cut across the ridge belt at angles from 30° to 90° (Frank and Head, 1988) and can sometimes be followed for hundreds of kilometers. While most ridges are unaffected by these features, some appear to be offset by them, suggesting strike-slip motion along the lineaments. Ridge belts most often occur at elevations within 2 km of the planetary mean, and correlation of ridge belts to Pioneer Venus topography shows that most ridge belts occur either on linear highs or on slopes adjacent to these highs. Venera topography shows that many ridge belts lie on broad highs up to 1.5 km high, though a few do occur in topographic depressions. The two major ridge belts in topographic lows are those located at 70°N, 180°E, and 48°N, 24°E, the valley of which are both about 300 km wide and 1.5 km deep.

Distribution: The distribution of ridge belts in the northern section of Venus varies with longitude (Figure 1). Ridge belts are most abundant between 150° and 250°E, where they tend predominantly north-south and are arrayed in a fan-shaped pattern verging towards the north pole. To the east of this, between 250° and 360°E, ridge belts are scarce, and the few that are present tend to have more of an east-west trend. In the area 0°-90°E, ridge belts are more abundant again, but this time in a more orthogonal pattern. These ridge belts are also closely associated with the large areas of deformed tesserae, usually bounding the tesserae. Ridge belts are again essentially absent from 90° to 150°E.

Origin: We follow the initial interpretation of Bsilevsky et al (1986) that the ridge belts are compressional features and cite the following additional evidence: (1) The broad morphology of these features is similar to the maria wrinkle ridges (Barsukov et al, 1986), which are interpreted to be formed by compressional (e.g., Sharpton and Head, 1987) and vertical (Lucchitta, 1976) movements. (2) The more detailed morphology of ridges within the belts is similar to the mountains surrounding Lakshmi Planum, which have uniformly been interpreted as compressional (Campbell et al, 1983; Crumpler and Head, 1986; Vorder Bruegge and Head, 1986; Pronin, 1986). (3) Ridge belts and the ridges within them are generally sinuous, as are compressional features on the Moon and Mars, while extensional features on the Moon and Mars tend to be more linear or broadly arcuate. (4) Lineaments that cut across ridge belts and adjacent plans often trend at a 60° angle to the ridge belts (Frank and Head, 1988), and where there is evidence of some strike-slip motion it is often in a direction consistent with compression and shortening across the ridge belt. Under extensional