

高等研究所 第 25 回 月例研究会

【日 時】 5月12日(水) 11:00 ~ 12:30

【会 場】 9号館5階 第1会議室

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【概要】

1. 品田 賢宏 (Takahiro Shinada) : 11:00 ~ 11:40(質疑応答含む)

「半導体技術を究めて、生命科学にも貢献する」



1958年に半導体集積回路が誕生してから50年が過ぎたところである。半導体デバイスの徹底した“微細化”によって集積回路の高性能化が実現され、最近ではスマートフォンといった魅力的なエレクトロニクス製品が誕生している。これを支えているのが半導体微細加工技術である。現在、デバイス寸法は20nm~30nmの領域に達し、技術的難度が一気に上がっている。今日、技術戦略は“伝統的微細化”から新材料、新構造、

新原理導入による“等価的微細化”と新たな応用を目指す“多様化”へ向かっている。

デバイス特性を制御するために、通常不純物原子(ドーパント)を意図的に添加する。ところが極度に微細化されたデバイスでは、ドーパントゆらぎに起因する特性ばらつきが主要な問題となっている。この問題を見極め、そして超えるために、世界に先駆けて開発した「単一イオン注入法(ドーパントを1個ずつ打ち込むことが可能)」を用いて試作したデバイスとその可能性、更に生命科学分野に応用する試みを紹介する。

"Pursuing the ultimate level of semiconductor technology, contributing to biological sciences"

Approximately 50 years has passed since the birth of the semiconductor integrated circuit in 1958. Smaller chip manufacturing has led to technological advances in integrated circuits, and has recently given birth to an alluring electronic product called

the smartphone. These new advances are being supported by semiconductor microfabrication technology. Presently, devices are as small as 20nm to 30nm, and the level of technical challenges are becoming higher and higher. Today, the technical strategy is shifting from the usage of “traditional miniaturization” to “equivalent miniaturization” via the incorporation of new materials, new structures, and new principle, and the strategy is also headed towards “diversification,” aiming for new applications.

Dopant impurity atoms are commonly intentionally added in order to control electrical properties. However in the case of extremely miniaturized devices, variations in electrical properties caused by the addition of dopants, has become a major problem. In order to identify and overcome this problem we will introduce a device and its capabilities, on which we tested the “single ion implantation method” (which makes it possible to implant one dopant atom at a time) which we developed ahead of all nations, as well as our approach to applying this method in biological science.

2. 金 泰均 (Taekyoon Kim) : 11:50 ~ 12:30 (質疑応答含む)

The Path Dependence of the Industrial Peace Formation: A Comparative-Historical Analysis of Tripartite Consultations in Korea and Japan



This research aims to advance a path-dependence analysis of the changing dynamics of corporatist governance in South Korea and Japan, comparing different paths of institutional intermediations where the tripartite actors – government, capital and labor – come to an agreement for reconciling their own interests towards the formation of industrial peace. Three research questions

are addressed: Why did the turbulent era of the labor offensive during two decades after World War II give way to the enduring hegemony of the corporate-centered society?; Is it true that the strong state in Korea failed to counterbalance the labor offensive in the post-democratized society, rather leading to the prolongation of the instability of industrial peace?; Why has the Korean path of corporatist arrangements evolved around

macro-corporatism of national tripartite consultations, which is posited as an opposite pattern of the Japanese path of micro-corporatism rooted in enterprise-level cooperation? By focusing on diverging concessions the corporatist actors utilize in order to maintain industrial peace, the research detects the causal relations between policy concessions and their increasing return dynamics, which determine the variations of path-dependence sequences. It argues that economic concessions tend to promote path-dependence sequences of corporatist governance (Japan), whereas political concessions are more likely to come up with path-shaping sequences (Korea).