سمینار هفتگی جبر جابه جایی

۹۶٫۱٫۳۱ *Jacobson's Commutativity Theorem*

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Abstract

A Boolean ring is a ring in which every element is an idempotent. One of the first things one learns about such rings is that they are commutative. Now consider a more general condition where a ring R satisfies $a^3 = a$ for every $a \in R$. Is R commutative? It turns out that this is true indeed, but giving a proof may be a small challenge. The case $a^4 = a$ is yet more entangled, but again the commutativity can be derived by ad hoc arguments. The question now arises as how far one can go to allow for higher exponents and still obtain commutativity. In other words, is there an exponent $n \geq 5$ such that $a^n = a$ for every $a \in R$, whereas R fails to be commutative? In this talk, I would like to zero in on this question and provide the remarkable answer.

۷ و ۹۶٫۲٫۱۴ *Ideal Approximation Theory*

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Abstract

Approximation theory is the part of relative homological algebra devoted to the study of resolutions (resp. coresolutions) of modules with respect to objects that are projective (resp. injective) relative to some subfunctor $\mathcal{F}$ of Ext. The notion of covers and envelopes by modules was introduced independently by Auslander-Smalø and Enochs and has proven to be beneficial for module theory as well as for representation theory. Ideal Approximation Theory has been recently introduced by Herzog, Fu, Guil Asensio and Torrecillas. This theory establishes an extension to ideals of morphisms in general exact categories of the usual theory of covers and envelopes by modules. The definition of cover and envelope by modules carry over to the ideals very naturally. Classical conditions for existence theorems for covers led to similar approaches in the ideal case. Even though some theorems such as Salce's Lemma were proven to extend to ideals, most of the theorems do not directly apply to the new case. In this talk, I will try to give a summary of the key aspects of ideal approximation theory, beginning with a review of the motivating results and arguments from the classical approximation theory

۲۱ و ۹۶٫۲٫۲۸ *Gröbner Basis*

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Abstract

In this talk, we give a brief overview on Gröbner bases theory. We explain the notion of Gröbner basis, the fundamental properties of Gröbner bases, the algorithm for constructing Gröbner bases, and some example of applications of Gröbner bases.

۹۶٫۳٫۴ *Extension Closedness of Syzygies*

مجید راهرو زرگر
پژوهشگاه دانشهای بنیادی و دانشگاه محقق اردبیلی

Abstract

In this talk, we review some recent results of S. Goto and R. Takahashi about the extension closedness of syzygies and local Gorensteinness of commutative rings. We also review the relationship between Serre's condition (R_n) and Auslander-Buchweitz's maximal Cohen-Macaulay approximations.

۹۶٫۳٫۱۱ *The Cleanness of (Symbolic) Powers of Stanley-Reisner Ideals*

سمیه بندری
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Abstract

Let Δ be a pure simplicial complex on the vertex set $[n] = \{1, \ldots, n\}$ and I_Δ its Stanley-Reisner ideal in the polynomial ring $S = K[x_1, \ldots, x_n]$. In this talk, we prove that Δ is a matroid (complete intersection, respectively) if and only if $S/I_\Delta^{(m)}$ (S/I_Δ^m, respectively) is clean for all $m \in \mathbb{N}$ and this is equivalent to saying that $S/I_\Delta^{(m)}$ (S/I_Δ^m, respectively) is Cohen-Macaulay for all $m \in \mathbb{N}$. By this result, we show that there exists a monomial ideal I with (pretty) cleanness property while S/I^m or $S/I_\Delta^{(m)}$ is not (pretty) clean for all integer $m \geq 3$. If $\dim(\Delta) = 1$, we also prove that $S/I_\Delta^{(2)}$ (S/I_Δ^2, respectively) is clean if and only if $S/I_\Delta^{(2)}$ (S/I_Δ^2, respectively) is Cohen-Macaulay.

Shelah's Solution of Whitehead's Problem ۱۸ و ۹۶٫۳٫۲۵

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Abstract

Let G be an abelian group. It is easily seen that if G is free then $Ext^1_{\mathbb{Z}}(G, \mathbb{Z}) = 0$. In early 1950th, Whitehead asked if the converse is also true, and since then, the problem was considered an important one in algebra for some years. Finally, the problem was solved by Shelah in 1974. Shelah's result was completely unexpected, as he showed that the Whitehead's problem is undecidable within standard ZFC set theory. In these talks, we will discuss Shelah's solution of the problem.

زمان: پنج شنبه ها ساعت ۱۱ الی ۱۲
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